

U.S. CHEMICAL SAFETY AND
HAZARD INVESTIGATION BOARD

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Kleen Energy Explosion

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Public Meeting
Portland, Connecticut
June 28, 2010

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6:30 p.m.

PRESENT FROM THE U.S. CSHIB:

DR. RAFAEL MOURE-ERASO, Chairman & CEO
DON HOLMSTROM, Investigations Supervisor
DAN TILLEMA, Investigator
LAUREN WILSON, Investigator
DISCUSSION PANEL I:

PROF. PAUL AMYOTTE, Dalhousie University (Canada)
ERVIN PATTERSON, Commissioning Management
Services, Inc.

LARRY DANNER, GE Energy

DISCUSSION PANEL II:

REP. MATTHEW LESSER, Connecticut House of
Representatives

PROF. GLENN CORBETT, John Jay College of Criminal
Justice (New York)

MICHAEL ROSARIO, Local 777, United Association of
Plumbers & Pipefitters

STEVEN SCHRAG, Connecticut Council on

Occupational Safety & Health

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

2 (6:29 p.m.)

3 CHAIR MOURE-ERASO: Good evening,
4 everyone. I would like to welcome residents of
5 the community of Middletown and all participants
6 of this U.S. Chemical Safety Board public
7 meeting.

8 My name is Rafael Moure-Eraso, and I
9 am the Chairman and Chief Executive Officer of
10 the Chemical Safety Board.

11 Our first order of business is to
12 inform everyone of the location of the safety
13 exits in this room in case of an emergency. As
14 you can see, there are two to the right, two to
15 the left, and two in the back wall over there.

16 Tonight we will gather and present
17 information here for members of the public, and
18 then vote on urgent recommendations arising from
19 the Chemical Safety Board investigation of the
20 explosion at the Kleen Energy powerplant site in
21 Middletown, Connecticut, that occurred in
22 February 2010.

1 This is actually my first activity as
2 the new Chairman of the Board. I was honored to
3 be nominated by the President and confirmed
4 recently by the Senate. My appointment became
5 effective just three days ago. I still don't
6 have business cards.

7 (Laughter.)

8 I, first of all, would like to thank
9 my colleague John Bresland here to my left. He
10 is a long-time -- I would like to say that he has
11 a long-time commitment to the work of the Board
12 for very many years, and he has been part of the
13 leadership of the Board as the chairman.

14 I also would like to introduce in the
15 panel here Mr. Mark Griffon, who, like myself,
16 was just recently nominated and appointed to the
17 Board, to the Chemical Safety Board. Mark is
18 sitting to that side.

19 Also, I have only been on the job a
20 few days. I am very familiar with the tragic
21 accident that occurred at Kleen Energy here, and
22 I am very concerned about it.

1 I have dedicated my professional life
2 to the improvement of worker safety, which I view
3 as a basic human right. My professional
4 experience has included work in chemical
5 facilities that manufactured and used toxic
6 chemicals. I have been responsible for worker
7 safety for 15 years, in two major organizations,
8 representing workers in the United States. These
9 include the United Auto Workers and the former
10 Oil Chemical and Atomic Workers Union.

11 I have been an educator on issues of
12 work environment for 22 years at the University
13 of Massachusetts, Lowell.

14 I would like to say that my most
15 rewarding experiences have been strategizing with
16 workers, with managers, and with communities to
17 prevent or substantially reduce the risk of
18 disastrous chemical incidents. My commitment to
19 worker safety will continue with the Chemical
20 Safety Board.

21 I would like to begin by first
22 remembering the victims, the six workers who were

1 killed as a result of the accident at Kleen
2 Energy. I will ask for a moment of silence after
3 I read the names of the workers killed. Ron
4 Crabb, Peter Chepulis, Raymond Dobratz, Chris
5 Walters, Roy Rushton, and Kenneth Haskell. May
6 we have a moment of silence in memory of those
7 workers.

8 (Whereupon, a moment of silence was
9 observed.)

10 Thank you.

11 The accident at Kleen Energy in
12 February is a reminder of what I believe is a
13 safety crisis that we are living in the U.S.
14 energy industry. Accidents in the gas, coal, and
15 petroleum extraction and petroleum refineries
16 during this last year have taken a staggering
17 toll of human lives and unprecedented
18 environmental damage.

19 Here in Middletown you have suffered
20 the loss of human lives, grievous injuries to
21 some people, grave disruption -- I'm sorry,
22 grave disruption of family lives, and destruction

1 of production facilities and jobs, and also, of
2 course, to the stopping of the opening of any
3 important new source of electricity, that has
4 been substantially delayed.

5 In coal, as you have heard in the
6 news, we have 29 miners killed in Raleigh County,
7 West Virginia, earlier this year. We all have
8 heard and seen on television about the 11 workers
9 killed and the massive destructive oil spill in
10 the Gulf of Mexico.

11 In the refinery sector, we have seen
12 all kinds of deaths and incidents. As a matter
13 of fact, the 18 current major investigations of
14 the Chemical Safety Board, seven of the 18 are in
15 oil refineries, and they have produced very many
16 dead and injured workers.

17 In my view, the energy industry in the
18 United States is in dire need of an overall plan
19 to prevent catastrophic accidents. It is my hope
20 that our meeting here in Middletown will result
21 in a first step toward that end. The results of
22 the investigation of the Kleen Energy accident

1 will be presented here by our investigation team
2 in the form of new, urgent safety recommendations
3 calling, among others, for OSHA to enact new
4 regulations to control this hazard and describing
5 alternatives to gas blows where a huge volume of
6 high-pressure natural gas is vented directly to
7 the atmosphere.

8 We have found a gap in the regulations
9 to control this practice and are committed to
10 prevent the continuation of the practice of gas
11 blows with natural gas that has impacted this
12 community so greatly.

13 The Chemical Safety Board is more than
14 an investigative responder after a chemical
15 accident has afflicted a community. The Chemical
16 Safety Board is the catalyst that will bring the
17 changes that will prevent this tragedy in our
18 community and in your community to be repeated.
19 We will be an agent of change.

20 It is that important work that we
21 conduct tonight. I wanted to let you know of my
22 commitment to preventing chemical accidents,

1 saving the lives and well being of workers and
2 the public, and working to greatly improve the
3 reliability of the U.S. energy industry today.

4 Let me explain the agenda for tonight.
5 We will first hear from the Chemical Safety Board
6 investigation team led by Don Holmstrom, and
7 following any questions that Board members in
8 this panel may have to the investigation team.

9 The team will offer a series of urgent
10 recommendations, as I noted a moment ago. We
11 will then hear from two panels of experts that
12 are sitting in front that will testify on issues
13 brought up by the Kleen Energy accident.

14 Board members and our investigation
15 team will question all panel members. We will
16 invite the public for comment. Anyone may speak,
17 but we ask that you please sign up in advance in
18 the book at the door, and please see our
19 representative at the table at the door. The
20 comments of the people in the audience will be
21 limited to three minutes.

22 After the public comment, the Board

1 will discuss the issues and recommendations that
2 have been proposed, and then vote on them. A
3 majority vote is required for the passage of the
4 recommendations.

5 At this time, I would like to ask to
6 any members of the Board that would like to have
7 any particular comment, and I will start with Mr.
8 Wright.

9 MEMBER WRIGHT: Thank you, Mr.
10 Chairman. I would just like to convey my
11 condolences to those families and workers that
12 were killed in this tragic incident back in
13 February. It is our goal to prevent these things
14 in the future, and hopefully tonight we will
15 understand in greater detail what happened and
16 what occurred at this particular site, and also
17 discuss some aspects of the ConAgra case.

18 Thank you, Mr. Chairman.

19 MEMBER BRESLAND: Mr. Chairman,
20 welcome to the Chemical Safety Board. I have
21 been on the Board since 2002, in the chair since
22 2008, and I have been intimately involved with

1 all of the investigations that have taken place
2 since 2002, including the BP Texas City refinery
3 accident, the Imperial sugar plant refinery
4 accident, and now coming up the accident in the
5 Gulf of Mexico that we are going to be starting
6 an investigation on very shortly.

7 Our goal is to make a difference, and
8 I believe over the years that we certainly have
9 made a difference as a new agency that came into
10 operation in 1998. And we have all worked hard,
11 both the staff and the Board members, to make a
12 difference.

13 I look forward to working with Dr.
14 Moure, look forward to working with him over my
15 additional three years on the Board, and I wish
16 you the very best of luck in your new position.

17 CHAIR MOURE-ERASO: Thank you very
18 much, John. I appreciate it.

19 MEMBER WARK: Yes, thank you, Mr.
20 Chairman. First of all, I would like to add my
21 condolences to what have been expressed here at
22 the hearing this morning, and let you know that

1 we are committed to do whatever we can to make
2 sure such an accident doesn't happen again.

3 I would also like to welcome you, Mr.
4 Chairman, and you, Mr. Griffon, to the Board, and
5 thank John Bresland for his outstanding service
6 to the Board as Chairman up until just recently.
7 And I would also like to -- which I have never
8 done in public before, but thank Member Wright
9 for serving as interim executive between
10 chairmen. Thank you.

11 MEMBER GRIFFON: Thank you, Mr.
12 Chairman. I would also like to add my
13 condolences for all the families and friends of
14 the victims of this tragic event at Kleen Energy.

15 As a new member of the Board, I think
16 I do need to say that I am very honored to be --
17 to have been appointed to the Chemical Safety
18 Board. Like Dr. Moure, I have worked most of my
19 career in environmental and occupational health
20 issues. I have had 20-plus years of advocating
21 for worker health and safety, so I feel very
22 strongly and committed to the mission of this

1 Board.

2 And I hope that my work with the Board
3 can help to make a difference of preventing
4 future accidents similar to the tragedy that
5 happened here. So I look forward to my term.

6 Thank you.

7 CHAIR MOURE-ERASO: Thank you, members
8 of the Board. And also, I would like to point
9 out that sitting with us here at the table is
10 Chris Warner, the General Counsel of the Board.

11 With that, I would like to move into
12 the agenda. First, I would like to introduce our
13 investigation team which is with us today,
14 sitting at the table to my right. We have three
15 investigators from the Denver regional office.
16 The investigative supervisor is Mr. Don
17 Holmstrom, and the other investigators that are
18 sitting with him is Dan Tillema and Lauren
19 Wilson.

20 Mr. Holmstrom, please proceed with
21 your presentation.

22 INVESTIGATOR HOLMSTROM: Thank you,

1 Chairman Moure-Eraso. I would like to thank
2 everyone for coming this evening. Tonight we
3 will present a summary of the U.S. Chemical
4 Safety Board's findings of the February 7, 2010,
5 explosion at the Kleen Energy powerplant in
6 Middletown, Connecticut.

7 In light of this tragedy, the
8 investigation team has concluded that urgent
9 recommendations are needed to be developed to
10 develop national workplace safety regulations and
11 standards which address the cleaning of fuel gas
12 piping and the unsafe practice of releasing
13 flammable natural gas to the atmosphere.

14 Three members of our team will be
15 presenting this evening, including Lauren Wilson,
16 Dan Tillema, and then I will conclude the
17 presentation.

18 This evening's presentation will begin
19 with a discussion of natural gas-fired
20 powerplants, their components, and how they work.
21 Then, we will describe the Kleen Energy incident,
22 the consequences of the explosion, followed by a

1 review of the CSB's findings and conclusions.

2 We will tell you about other incidents
3 similar to the Kleen explosion and what can be
4 learned from these incidents. We will then
5 discuss other methods which can be used to safely
6 clean natural gas piping. We will review the
7 existing codes, standards, and regulations
8 pertaining to fuel gas safety, and we will
9 identify where we have found gaps in these
10 regulations and standards.

11 We will conclude our presentation to
12 the Board by proposing a number of
13 recommendations to improve federal regulations,
14 safety codes, and industry guidance, in order to
15 prevent similar catastrophic natural gas
16 incidents from occurring in the future.

17 I would now like to welcome
18 Investigator Lauren Wilson to discuss the Kleen
19 incident. Lauren.

20 INVESTIGATOR WILSON: Thank you, Mr.
21 Holmstrom.

22 This photo shows the Kleen Energy

1 powerplant in October of 2009. This is what is
2 called a combined cycle natural gas plant. This
3 means that electricity is generated through using
4 a combination of methods. In the first step,
5 natural gas is combusted or burned. The
6 combustion gases travel through gas turbines
7 housed here in this building to generate
8 electricity.

9 In the second step, the heat from
10 these gases is recovered to create steam in these
11 heat recovery steam generators. The steam then
12 travels through a steam turbine located here to
13 generate additional electricity. The main
14 building houses two natural gas turbines. A
15 photo showing the inner blades of the gas turbine
16 is shown here. The turbine blades are precisely
17 constructed in order to generate electricity
18 efficiently.

19 Therefore, turbine manufacturers
20 typically require that the gas delivered to these
21 turbines is free of damaging debris, so that no
22 dust or particles can impact and potentially

1 damage these turbine blades.

2 Kleen chose to remove this debris
3 using a method called a "gas blow." In a gas
4 blow, natural gas, which is readily available at
5 the sites, is used to force any turbine-damaging
6 debris from the line. This is done by attaching
7 a vent pipe or outlet pipe to the fuel gas
8 piping. A valve is opened, allowing the high-
9 pressure gas to exit the vent pipe at a very high
10 velocity.

11 This photo on the right shows a gas
12 blow performed at Kleen Energy a week before the
13 explosion. One can see the dust and debris
14 exiting the pipe, as well as the sheer height and
15 extent of the gas cloud.

16 Like the week before, this method of
17 using natural gas to blow debris from the piping
18 was also conducted at the Kleen Energy site on
19 February 7th. The natural gas blows released a
20 very large quantity of natural gas, which is an
21 extremely flammable material. It was this
22 activity that led to the explosion.

1 Throughout the morning, prior to the
2 explosion, a total of 15 natural gas blows were
3 completely intermittently over approximately four
4 hours through a number of open-ended pipes that
5 were located less than 20 feet off the ground.
6 Two of the gas blow locations are shown here,
7 indicated by the yellow arrows. These vents were
8 adjacent to the south wall of the main power
9 generation building at the site.

10 Approximately 150 workers were at the
11 construction site on Sunday, February 7th, the
12 day of the explosion. During the natural gas
13 blow activities, non-essential personnel working
14 outside immediately south of the main power
15 generation building were removed from the
16 restricted area.

17 However, more than 50 individuals were
18 working inside the power generation building,
19 performing job functions such as welding, during
20 the gas blows. Only about 15 of the 50 were
21 actually involved in the natural gas blow
22 activities.

1 Releasing large quantities of
2 flammable natural gas is a dangerous activity, in
3 that an explosive atmosphere can accumulate near
4 workers. This photo shows a gas blow performed
5 at Kleen Energy a week prior to the incident in
6 which the vent pipe was angled vertically.
7 Again, this photo captures the height and extent
8 of the gas cloud created in the blow.

9 This photo was taken during a gas blow
10 also on the day of the incident at the location
11 indicated by the dotted lines. But the
12 congestion and horizontal orientation of the
13 piping were similar to the conditions present in
14 the blow that caused the explosion.

15 Here you can see where the incident-
16 causing blow took place. Natural gas was being
17 blown from an open-ended pipe in an area
18 immediately south of the power generation
19 building. This location, while outdoors, was
20 congested by the surrounding power generation
21 equipment. The vent pipe itself was installed in
22 a relatively horizontal orientation. Both the

1 congested area and the orientation of the vent
2 pipe likely allowed a flammable vapor cloud to
3 accumulate.

4 At approximately 11:15 a.m., the
5 released natural gas found an ignition source and
6 exploded. Six individuals were fatally injured.
7 They were all within the power generation
8 building at the time of the explosion. Five of
9 them were involved with the natural gas blow
10 activities, and one was not. This incident also
11 resulted in many injuries due to the close
12 proximity of the workers at the time of the
13 explosion.

14 In addition, this approximately \$1
15 billion facility experienced significant damage,
16 as can be seen in the photos on the right.

17 This graph shows the characteristics
18 of the 15 gas blows performed on the day of the
19 incident. Each bar represents a single gas blow.
20 Let me walk you through the graph.

21 The vertical axis indicates the volume
22 of gas release, so this ranges from zero to

1 350,000 standard cubic feet. The horizontal axis
2 indicates the time over the course of the morning
3 on February 7th. The first bar represents the
4 first blow performed at approximately 7:35 a.m.,
5 and the last bar indicates the blow that was
6 performed just before the explosion.

7 I would also like to point out that
8 the gas blow which actually released the largest
9 amount of gas actually occurred about an hour
10 before the explosion.

11 Our calculations indicate that in the
12 final 10 minutes before the blast approximately
13 480,000 standard cubic feet of natural gas were
14 released outdoors near the building. Just over
15 two million standard cubic feet of natural gas
16 were released in total over the course of the
17 morning.

18 To put that into some perspective,
19 that is more than two billion BTUs worth of gas.
20 This is enough to fuel a typical American home
21 every day for more than 25 years.

22 It is extremely important to realize

1 that ignition sources are quite challenging to
2 determine and extremely difficult to eliminate.
3 Therefore, the best way to remove any risk of an
4 explosion is to avoid creating a flammable
5 atmosphere in the first place. In the Kleen
6 incident, the CSB did not determine which
7 specific ignition source ignited the gas cloud.
8 However, several possibilities existed.

9 The CSB identified ignition sources
10 both outside and inside the main building.
11 Workers made efforts to eliminate or control
12 potential ignition sources outside of the power
13 generation building, but some ignition sources
14 were extremely difficult to eliminate or even
15 impossible to eliminate.

16 One of these potential outdoor
17 ignition sources could actually have been the gas
18 blow itself. Yet another factor that makes gas
19 blows a dangerous operation is that gas blows can
20 be self-igniting. For instance, static
21 electricity can accumulate due to the high
22 velocity of gas exiting the piping. If a

1 flammable atmosphere is present, this can cause
2 an explosion.

3 Also, metal debris exiting the piping
4 during the gas blow can strike nearby metal
5 structures causing a spark, which also can ignite
6 flammable vapors.

7 Ignition sources were also present
8 indoors. For instance, electrical power was on,
9 welders were actively working, and diesel-fueled
10 heaters were also running inside the building.

11 The CSB would like to note that other
12 investigative agencies are looking at additional
13 potential ignition sources. However, with the
14 CSB's mission of accident prevention, we view
15 that the formation of a flammable vapor cloud is
16 the fundamental hazard.

17 I will now turn the presentation over
18 to Investigator Dan Tillema, who will discuss two
19 previous gas blow incidents and other key
20 information in our investigation.

21 Thank you.

22 INVESTIGATOR TILLEMA: Thank you, Ms.

1 Wilson.

2 In the course of our investigation,
3 the CSB has uncovered two other incidents which
4 were caused by natural gas blows. These two
5 incidents highlight the fact that gas blows can
6 provide their own source of ignition.

7 The first natural gas blow incident we
8 identified occurred in October of 2001 at a First
9 Energy power station in Lorain, Ohio. This
10 facility also used the gas blow method to clean
11 fuel gas piping. Shortly after beginning the gas
12 blow, the gas ignited, causing a flame to shoot
13 approximately 30 to 40 feet into the air. There
14 were no injuries, but the fire caused damage to
15 nearby equipment.

16 Company investigators concluded that
17 the gas blow was self-igniting. The natural gas
18 was most likely ignited by metal debris exiting
19 the piping during the blow, which impacted a
20 nearby metal surface causing a spark.

21 The second gas blow incident we
22 identified occurred in January 2003 at Calpine's

1 Wolfskill Energy Center, natural gas powerplant,
2 in Fairfield, California, seen here in this
3 photo. At this facility, high-pressure natural
4 gas was blown directly to the atmosphere to
5 remove any debris from the piping.

6 The natural gas released during this
7 gas blow activity found an ignition source and
8 exploded. In this case, Calpine determined that
9 static electricity from the gas exiting the pipe
10 likely ignited the flammable natural gas as it
11 was released.

12 The explosion was powerful enough to
13 shatter windows a quarter of a mile away and was
14 heard up to 10 miles from the site. No one was
15 injured as a result of this explosion.

16 Calpine's investigation report
17 identifies other methods were available to clean
18 the gas piping, such as using air blows.

19 The CSB has found that turbine
20 manufacturers typically require powerplants to
21 meet fuel piping cleanliness requirements as part
22 of their turbine warranty. The cleanliness

1 criteria are usually met by placing a target at
2 the pipe exit during a gas blow. These targets
3 are often either pieces of plywood or metal
4 strips, which show impact marks each time a piece
5 of debris strikes it.

6 The picture on the right shows a
7 target holder in use at the Kleen Energy -- at
8 Kleen Energy on the morning of the explosion.

9 A representative of the turbine
10 manufacturer is commonly present during the
11 cleaning activities to inspect these targets.
12 The representative ensures that the target impact
13 marks fall below a predetermined limits in sizes,
14 indicating that the gas line is sufficiently
15 clean to meet the warranty requirements.

16 The CSB acquired information regarding
17 the construction plans of powerplants to be built
18 between 2010 and 2015. Of the companies who
19 reported their turbine manufacturer plans, six
20 turbine manufacturers -- General Electric,
21 Siemens, Solar, Mitsubishi, Pratt & Whitney, and
22 Rolls Royce -- are projected to supply 100

1 percent of the gas turbines that will be
2 installed in powerplants coming online in the
3 next five years.

4 Natural gas blows are not the only
5 available method to clean fuel gas piping. In
6 fact, companies use a variety of techniques. For
7 example air blows and nitrogen blows are other
8 methods used to clean gas piping. They perform
9 exactly the same cleaning function as natural gas
10 blows.

11 However, because there is no release
12 of a flammable gas cloud, these methods eliminate
13 the risk of fires and explosions. As nitrogen
14 can present an asphyxiation hazard, additional
15 precautions are warranted prior to conducting a
16 nitrogen blow.

17 Another cleaning method used by
18 industry is pigging. This animation demonstrates
19 the pigging process. A piece of debris is
20 forcefully pushed through the line and removed.
21 A gas or liquid is used as the mode of force to
22 propel the pig. When performed with air or

1 nitrogen, this method also eliminates the risk of
2 producing a flammable gas cloud.

3 Steam blows, or cleaning with water or
4 chemicals, is also sometimes used to remove rust
5 or debris from piping. GE and Siemens, the two
6 turbine manufacturers who currently supply the
7 largest number of gas turbines to powerplants,
8 each promote the use of air blows. They support
9 the fact that air blows are just as effective as
10 natural gas for cleaning fuel gas piping. The
11 CSB has not identified a scenario where natural
12 gas blows are necessary to clean fuel gas piping.

13 The CSB recently conducted an industry
14 survey with the assistance of the Combined Cycle
15 Users Group in April of 2010. The CSB received
16 62 responses to the survey. Of the respondents,
17 63 percent indicated that they have used natural
18 gas blows to clean their facility's gas piping.
19 Only one of these respondents indicated that the
20 natural gas was safety destroyed through use of a
21 flare.

22 The CSB also asked these members to

1 indicate what cleaning methods are being
2 practiced within their company or facility. This
3 pie chart portrays the various methods that the
4 respondents indicated they have used to clean
5 their fuel gas piping. The large blue portion
6 indicates that 37 percent of the respondents have
7 used gas blows.

8 The remaining segments indicate other
9 methods used, such as pigging and air blows.

10 These data indicate that the most common method
11 to clean piping amongst the respondents is the
12 use of gas blows. Although no method is
13 completely free of risk, safer methods, such as
14 air blows, eliminate the fire hazards associated
15 with natural gas.

16 Approximately half of the survey
17 respondents did not have a technical basis for
18 determining the natural gas blow needed to
19 adequately clean the piping when conducting
20 natural gas blows. The lack of a thorough
21 technical evaluation can result in the release of
22 substantially greater quantities of natural gas

1 than what is actually needed. This creates an
2 unnecessary risk to nearby workers.

3 Companies that do perform a technical
4 evaluation prior to cleaning newly installed fuel
5 gas piping commonly refer to a technical
6 criterion called the cleaning force ratio, or
7 CFR. This ratio provides the minimum flow
8 conditions needed to successfully clean gas
9 piping.

10 Siemens, the turbine manufacturer at
11 Kleen, provided a CFR target of two, but did not
12 specify an upper limit. Data from the day of the
13 incident indicates that in the blows prior to the
14 explosion the CFR of two was greatly exceeded.
15 Therefore, significantly more natural gas was
16 released than was actually needed to remove
17 debris from the piping.

18 Another issue to consider when
19 cleaning fuel gas piping is that in any natural
20 gas blow flammable mixtures will unavoidably
21 occur downstream of the vent outlet. To minimize
22 the extent of the flammable gas cloud, a complex

1 technical evaluation of various factors is
2 necessary, including height, location, and
3 orientation of the vent pipe, velocity and
4 density of the discharging gas, potential sources
5 of ignition, personnel location, wind speed, and
6 a dispersion analysis to verify that the natural
7 gas will readily dissipate.

8 These complex requirements for
9 discharge design are either not necessary or are
10 greatly simplified for other cleaning methods
11 such as air blows. Thus, these are compelling
12 reasons to implement safer alternatives to
13 flammable gas releases.

14 I will now turn the presentation over
15 to investigations supervisor Don Holmstrom.

16 INVESTIGATOR HOLMSTROM: The CSB has
17 studied the current codes and standards relating
18 to the electric power generation sector and
19 natural gas-fired powerplants. We have found
20 that the current NFPA codes provide limited to no
21 guidance on how to clean fuel gas piping safely.
22 Specifically, NFPA 54, the National Fuel Gas

1 Code, broadly addresses fuel gas piping safety,
2 but does not address safe practices for fuel gas
3 pipe cleaning.

4 It also explicitly exempts fuel gas
5 piping in powerplants. NFPA 37, standards for
6 installation and use of stationary combustion
7 engines, and gas turbines, provides criteria to
8 minimize fire hazards during installation and
9 operation of gas turbines. But it provides no
10 guidance on how to clean gas piping without
11 creating a fire and explosion hazard.

12 NFPA 850, a recommended practice for
13 fire protection for electric generating plants,
14 provides fire hazard control recommendations for
15 the safety of the construction project and
16 personnel. But it does not address safe
17 practices for cleaning fuel gas piping.

18 In addition, ASME B31-1 provides
19 guidance for cleaning fuel gas piping, but does
20 not prohibit natural gas blows. And FM Global,
21 their document "Natural Gas and Gas Piping,"
22 calls for the use of air or inert gas to clean

1 piping, but allows for the use of fuel gas when
2 pressure is a half a pound per square inch or
3 less.

4 In summary, there are currently no
5 standards on fuel gas pipe cleaning, and
6 extremely limited industry guidance is available
7 in regards to cleaning fuel gas piping.

8 This graph shows that the consumption
9 of natural gas as a fuel in the U.S. far exceeds
10 its consumption or production of flammable gases.
11 Natural gas usage exceeds that of propane.
12 Propane is the small red bar, and natural gas is
13 the large tall blue bar there, the second most
14 utilized flammable gas, 15 times over.

15 While natural gas is by far the most
16 used flammable gas, it is one of only two not
17 regulated by OSHA. The CSB would also like to
18 note that natural gas is regulated by the
19 Department of Transportation's Pipeline and
20 Hazardous Material Safety Administration, before
21 entering a company's property. After that point,
22 natural gas is unregulated.

1 OSHA's regulatory scheme provides
2 requirements for controlling ignition sources in
3 locations that may have a flammable atmosphere.
4 However, these requirements do not expressly
5 prohibit the planned release of flammable gas in
6 the vicinity of workers. Also, OSHA's process
7 safety management standard, or PSM standard,
8 addresses requirements for preventing
9 consequences of a catastrophic release of
10 flammable materials.

11 However, the PSM standard exempts
12 flammable liquids or gases that are used solely
13 for workplace fuel consumption. In addition,
14 OSHA currently has no regulatory requirements for
15 workers to participate in developing procedures
16 or training related to fuel gas safety.

17 The electric power generation sector
18 and related industry associations do not
19 currently operate a safety standards development
20 program or publish industry-recognized safety
21 standards. There are no recognized good practice
22 safety standards or technical guidelines that

1 address the cleaning of powerplant fuel gas
2 piping.

3 Approximately 125 powerplants will
4 commission new natural gas-fired combustion
5 turbines between the years 2010 and 2015. This
6 graphic indicates the location density of the
7 various plants across the United States. And, as
8 you can see, the green plants and the plants --
9 or the states in green, and also in yellow, have
10 the highest density of powerplants, with
11 Connecticut up here showing six to eight plants
12 in the next five years.

13 Companies continue to conduct natural
14 gas blows, even after the Kleen Energy explosion.
15 After contacting 33 natural gas powerplants
16 currently under or near construction, the CSB has
17 learned of two plants that have conducted a
18 natural gas blow since the Kleen incident, and
19 several others are actively planning natural gas
20 blows.

21 The CSB reasserts that the intentional
22 release of natural gas presents many significant

1 safety risks. Incidents caused by the release of
2 natural gas do not only occur at powerplants.
3 For example, an explosion at ConAgra Foods in
4 2009, which is also being investigated by the
5 CSB, was caused by the release of natural --
6 excuse me, of natural gas near workers. Four
7 people were killed in this explosion.

8 The CSB also found many other
9 incidents caused as a result of releasing natural
10 gas into work areas. These incidents are
11 identified in the Safety Bulletin "Dangers of
12 Purging Natural Gas into Buildings." To prevent
13 future natural gas-related incidents, the CSB
14 investigation team proposes several urgent
15 recommendations.

16 Before delivering these
17 recommendations, we would first like to take some
18 questions from the Board.

19 Thank you.

20 CHAIR MOURE-ERASO: Thank you for a
21 detailed presentation, Mr. Holmstrom. It is
22 obvious that your team has put a considerable

1 amount of time and effort into your findings, and
2 I would like to ask for any questions of members
3 of the Board of the -- to the investigation team.

4 So please state your name and ask your
5 question, starting this side.

6 MEMBER GRIFFON: Mark Griffon. Yes,
7 I have just one question on the -- I forget who
8 presented on this, but it was the survey results
9 for -- of the different manufacturers. And you
10 indicated that 63 percent indicated the use of
11 gas blows. I was wondering if you have any
12 information on how many of those consider these
13 other alternatives. Did they do any assessment
14 of whether and why -- if they did that, then why
15 did they end up continuing with this practice?

16 INVESTIGATOR TILLEMA: Actually, no.
17 No. The survey questions were not written in a
18 way that would allow us to extract that data. We
19 wrote these survey questions with the Combined
20 Cycles Users Group very early in March, and the
21 questions probably would be written better and
22 differently had we done them later, but we were

1 trying to get as much information as quickly as
2 possible about the existing industry practices.
3 So, no, I don't have that information.

4 INVESTIGATOR HOLMSTROM: Mr. Griffon,
5 I would add that, although natural gas was the
6 single most commonly used method for cleaning
7 fuel gas piping, that the safer alternatives
8 amounted to about half of the overall responses,
9 which indicated that safer alternatives are being
10 utilized out there and are certainly considered
11 practical and feasible by a number of those that
12 are cleaning fuel gas piping.

13 MEMBER GRIFFON: Thank you.

14 CHAIR MOURE-ERASO: Any other
15 questions from the Board?

16 MEMBER WARK: I --

17 CHAIR MOURE-ERASO: Go ahead.

18 MEMBER WARK: Yes. Something of a
19 recurring theme that we see in our
20 investigations, and have seen in our
21 investigations such as BP Texas City and others,
22 suggest that fatigue, excessive overtime, was a

1 contributing factor to some of the accidents that
2 we have looked at. And my question to you is:
3 did you -- did the team look at the possibility
4 of fatigue and maybe mistakes being made as a
5 result of it?

6 INVESTIGATOR HOLMSTROM: Yes. To
7 answer your question, Mr. Wark, the team looked
8 at issues related to fatigue. However, fatigue
9 is only relevant in relationship to what would be
10 identified as a human performance issue. If
11 there was something that -- a switch that wasn't
12 pulled or a valve that wasn't closed or some
13 error in the procedure, typically we would look
14 to see if fatigue might have played a role in
15 that activity.

16 At this incident, however, our team
17 determined that the result -- what led to this
18 accident was actually largely following the
19 procedure and the guideline, that it not only was
20 utilized in this particular site, but utilized in
21 a number of sites throughout the country, and
22 that it is precisely a lack of guidance, a lack

1 of standards, and a lack of regulations that
2 would prohibit this type of inherently unsafe
3 activity of blowing extremely large amounts of
4 gas, in this case releasing about the same amount
5 of gas that would fill a professional sports
6 arena with a flammable mixture, was released in
7 the last 10 minutes before this accident.

8 And we consider that activity to be
9 the focus of our investigation that led to the
10 explosion.

11 MEMBER WARK: That's all I have.

12 Thank you.

13 CHAIR MOURE-ERASO: Mr. Bresland.

14 MEMBER BRESLAND: Mr. Holmstrom, to
15 have an explosion, you need three items -- air,
16 an ignition source, and flammables. And,
17 normally, when those three items are present, you
18 would be doing some testing, or the company would
19 be doing some testing to see if the atmosphere in
20 the area was dangerous. Was any testing done
21 during these blows?

22 INVESTIGATOR HOLMSTROM: There was the

1 use of a combustible gas detector that was being
2 used inside the powerplant building. The CSB, in
3 conjunction with a number of other investigative
4 agencies, examined that combustible gas detector
5 recently, and we are correlating the results from
6 that testing with other factors related to the
7 incident.

8 But I can report that witnesses who
9 were inside the powerplant building reported that
10 there were alarms that went off, at least on two
11 occasions, related to the combustible gas
12 detector. And so we are looking at the actual
13 results we got with -- that has a different date
14 and time stamp related to it, and comparing that
15 to the data that we know from other circumstances
16 and facts related to the combustible gas detector
17 readings.

18 MEMBER BRESLAND: And another
19 question, I wonder if -- you know, the issue that
20 has puzzled me about this particular incident
21 since I heard about it, and not knowing very much
22 about this type of operation before we heard

1 about this explosion, it has always puzzled me
2 that a company would be spending a billion
3 dollars building a facility, and you would be
4 within three months of starting it up. And then,
5 they do this inherently dangerous process of
6 venting natural gas into the atmosphere in the
7 middle of the facility, and, unfortunately, in
8 this case it caused this terrible explosion and
9 the impact on -- terrible impact on the people
10 involved.

11 Did you have any opportunity to ask
12 the companies kind of, you know, why do you do
13 this?

14 INVESTIGATOR HOLMSTROM: I think that
15 question could best be answered by saying that
16 this is a long-standing practice in the industry,
17 that there is a history of this type of activity.
18 And I think often also our understanding of
19 looking at this industry is there is not a body
20 -- we mentioned earlier there wasn't a body that
21 developed safety codes.

22 There wasn't a code developing council

1 within this body, and I think it makes it more
2 difficult to spread safety lessons learned from,
3 for example, these previous incidents that
4 occurred. And so, as a result, I think that
5 there was a lack of communication of some of the
6 previous incidents as well as a lack of
7 appreciation of some of the hazards by some in
8 industry.

9 I think others appreciate the hazards
10 and have developed procedures and techniques to
11 avoid them. But I think that one of the things
12 that can lull organizations into thinking
13 something is safe is that they didn't have a
14 previous explosion. But we know that these
15 catastrophic incidents are low-probability, high-
16 consequence events, that it takes a number of
17 factors and a number of causes to line up, which
18 are often very unlikely to occur in order for
19 this accident to happen.

20 And in the case of a gas blow, you
21 have to have a source of ignition in just the
22 right location, whether it is a flammable

1 atmosphere on a day where it -- things happen to
2 line up and that explosion occurs. So that is
3 not to say that just because a gas blow happens
4 that that gas blow was safe and another gas blow,
5 because there was an explosion that was
6 hazardous, they are all hazardous. It just
7 happens that one happened to find a source of
8 ignition, which led to an explosion.

9 And I think that that type of
10 activity, where there isn't an explosion every
11 time this activity occurs, is going to lull
12 companies into thinking that somehow there is --
13 this activity is safer than it really is.

14 MEMBER BRESLAND: Okay. Thank you.

15 MEMBER WRIGHT: Bill Wright. First of
16 all, let me thank the team for deploying from
17 Denver to respond to this incident in
18 Connecticut, as Washington, D.C., was under a
19 storm which prevented any teams from flying up
20 here. So thank you for that. And I know you
21 undertook this particular case on top of a heavy
22 workload that you have going out in the Denver

1 office.

2 Earlier you mentioned that there was
3 no safety briefing prior to the gas blow on that
4 particular day, Superbowl -- or on Sunday. My
5 question is: do you think that had they had a
6 safety briefing that this would have been
7 prevented?

8 INVESTIGATOR HOLMSTROM: One of the
9 things we noted during the course of the release
10 of gas is that some workers were concerned about
11 it, some workers left the building, sort of took
12 action by walking out of the building, and I
13 think there was a perception amongst some workers
14 that there was a hazard present from the facts of
15 the incident.

16 Safety meetings and briefings and
17 opportunities to go over procedures and ask
18 questions and raise issues and concerns are
19 opportunities for the workforce as a whole --
20 workers, managers, safety professionals, and
21 others -- to discuss the details and the safety
22 aspects of any proposed activity that has a lot

1 of dangers to it.

2 And oftentimes when those
3 opportunities are allowed to take place, there
4 are activities and understandings that are
5 reached that in fact avoid the dangerous result,
6 and help prevent and possibly lead to other safer
7 ways of conducting those activities. And so we
8 think it is important that workers, contractors,
9 and others be involved in developing procedures,
10 and in the training, and in the development of
11 the activities themselves, so that all of those
12 points of view can be brought to bear, and
13 hopefully a safer result will come out in the
14 end.

15 MEMBER WRIGHT: And I think you would
16 agree that in this particular case they failed to
17 safely control all of those factors that you
18 described on page 23 of your presentation --
19 height, location, and orientation of the vent
20 pipe, velocity and density of discharging gas,
21 potential ignition sources, personnel locations,
22 wind directions and speed, and dispersion

1 analysis that they probably failed to do in this
2 particular case.

3 INVESTIGATOR HOLMSTROM: Well, I think
4 there was a few that they did well that were in
5 their procedures, and I think there were a number
6 of others that weren't in their procedures but
7 would be important to undertake.

8 And I think the point that we are
9 making here is that, given the fact that there
10 are catastrophic consequences that can result
11 from a release of gas, the fact that there is a
12 difficult technical evaluation, and the fact that
13 there are readily available alternatives that are
14 just as feasible and practical as using gas,
15 there is nothing inherent in flammable gas that
16 makes it any better as a motor force for moving
17 -- removing debris than nitrogen or air, that
18 that all lends itself to supporting safer
19 alternatives as opposed to the riskier
20 proposition of doing that technical evaluation
21 and complex analysis, and having one of the
22 complex items fail and lead to a catastrophe.

1 MEMBER WRIGHT: And just as a
2 followup, what particular items did they not have
3 in place that may have prevented this? And, by
4 the way, I'm not advocating the use of gas in
5 these things.

6 INVESTIGATOR HOLMSTROM: Right.

7 MEMBER WRIGHT: Having visited the
8 site today, and seeing where that particular vent
9 pipe was in relation to the buildings and the
10 surrounding area, it seems obvious that that is
11 sort of inviting a catastrophic event,
12 particularly at those pressures and volumes.

13 But can you conceive of a way of
14 safely doing it if they still elected to use gas
15 as that medium?

16 INVESTIGATOR HOLMSTROM: Mr. Wright,
17 the reason that the team didn't go down the road
18 of analyzing those alternatives is because we
19 firmly believe that the safer alternatives are so
20 much more practical and feasible as an
21 alternative. It is not an onerous choice. It is
22 a fairly easy choice.

1 And we have not been able to determine
2 any scenario that gas would be required, or where
3 something other than gas would not be feasible.
4 Anywhere you could utilize gas as the motor force
5 for moving debris out of piping, you could also
6 use nitrogen or air.

7 So that is our conclusion, and we
8 think that by informing others of that choice,
9 who might not currently be aware that that is an
10 easy thing to do, and I think some of our
11 panelists hopefully will opine on that later in
12 our program, I think that we can educate the
13 public that releasing all of this hazardous
14 material to the environment is really not the
15 best choice.

16 MEMBER WRIGHT: Thank you very much.

17 INVESTIGATOR HOLMSTROM: Thank you.

18 MEMBER WRIGHT: Appreciate it.

19 CHAIR MOURE-ERASO: I have the
20 opportunity to ask a question, too. I will ask
21 the panel in general that if, in the course of
22 your investigation, you have an opportunity to

1 evaluate the place and quality of safety services
2 that existed inside your operation, I -- my
3 question refers -- you have mentioned issues that
4 it was -- fatigue might be a factor, and the
5 absence of safety meetings previously to the day
6 of the explosion.

7 And, you know, my concerns is the way
8 that work is organized, you know, where was the
9 place of safety in the way the work is organized?
10 You know, I mean, how it was valued within the
11 organization or the production during the
12 construction time? And you were able to evaluate
13 that?

14 INVESTIGATOR HOLMSTROM: I think that
15 in this particular case they had safety
16 professionals onsite. They had had safety
17 meetings and instruction to a larger group of
18 people in the gas blows that occurred the
19 Saturday before the Sunday of the explosion, so
20 that there wasn't a lack of that activity.

21 I think there was thinking that it
22 wasn't perhaps needed on this particular day,

1 because of the instructions that had occurred the
2 week before. I think ultimately it wasn't the
3 lack -- we mentioned the procedures weren't
4 shared with the workforce, which we think is
5 important to do, which can give the workforce an
6 opportunity to weigh in on the overall safety of
7 the activity.

8 But that being said, it is the actual
9 procedure and the activity itself that presents
10 the inherent safety hazards. So I think that is
11 why we believe it is more -- in this case we
12 believe the focus is more important to be placed
13 on the broader systems of safety -- of safety
14 standards, regulations -- that can be used and
15 guide companies across the country who are
16 considering things like these natural gas blows,
17 and they can understand the hazards and the
18 alternatives that are available.

19 CHAIR MOURE-ERASO: Thank you, Don.

20 INVESTIGATOR HOLMSTROM: Yes.

21 CHAIR MOURE-ERASO: Any more questions
22 from the Board?

1 MEMBER GRIFFON: Mr. Chairman, if I
2 could, just one followup question to -- actually,
3 to Mr. Bresland's question and your response,
4 Don. You indicated that alarms went off on prior
5 runs or prior days, I'm not sure exactly the
6 timing on those. But I guess my -- you know, the
7 obvious question there was, did -- were there any
8 followups on those? Were those viewed as near-
9 misses? Did the company investigate those? And
10 any actions that came out of those alarms?

11 INVESTIGATOR HOLMSTROM: Yes. The
12 ones I'm referring to were on the day of the
13 incident itself. One was approximately 10:45,
14 and the other was just maybe a minute and a half
15 before the explosion. And I think in this
16 particular case what is important to point out,
17 while in some OSHA regulations -- for example, in
18 the confined space standards -- there are some
19 specific provisions such as requiring that the
20 confined space permit program be triggered at 10
21 percent of the LEL.

22 And some safety standards have

1 provisions for hot work, that you can't conduct
2 hot work if you are above a certain percent --
3 low percentage of the LEL, such as 10 percent.
4 There is no general provision in the United
5 States that protects workers in the general work
6 environment at a particular LEL, or would require
7 that workers evacuate a building if there is a
8 certain percentage of an LEL, other than a
9 confined space, or hot work.

10 And I think other jurisdictions, as we
11 note in our document, in California and in
12 Canada, do have those protections for workers,
13 and that is part of our recommendation to OSHA is
14 those protections be provided, so that it is very
15 clear and it is not in dispute that if you have a
16 percentage of LEL, such as 12, which we think
17 perhaps occurred on the day of the question, or
18 even higher, such as 19, that those would trigger
19 an immediate evacuation of the area and
20 potentially protect workers from that flammable
21 environment.

22 MEMBER GRIFFON: Thank you, Mr.

1 Holmstrom.

2 INVESTIGATOR HOLMSTROM: Yes.

3 CHAIR MOURE-ERASO: If there are no
4 more questions from the Board, I would like to
5 continue with the presentation of the
6 investigation team on the proposed urgent safety
7 recommendations. So please proceed, Mr.
8 Holmstrom.

9 INVESTIGATOR HOLMSTROM: We will start
10 out with the first recommendation is -- set of
11 recommendations is to the Occupational Safety and
12 Health Administration, OSHA.

13 To the Occupational Safety and Health
14 Administration, promulgate regulations that
15 address fuel gas safety for both construction and
16 general industry. At a minimum, prohibit the
17 release of flammable gas to the atmosphere for
18 the purpose of cleaning fuel gas piping.

19 Next, prohibit flammable gas venting
20 or purging indoors. Prohibit venting or purging
21 outdoors where fuel gas may form a flammable
22 atmosphere in the vicinity of workers and/or

1 ignition sources.

2 In addition, prohibit any work
3 activities in areas where the concentration of
4 flammable gas exceeds a fixed low percentage of
5 the lower explosive limit determined by
6 appropriate combustible gas monitoring. And
7 require that companies develop flammable gas
8 safety procedures and training that involves
9 contractors, workers, and their representatives
10 in decisionmaking.

11 The next set of recommendations is
12 addressed -- that are proposed is addressed to
13 the National Fire Protection Association, NFPA.
14 Enact a tentative interim amendment, as well as
15 permanent changes to the National Fuel Gas Code,
16 that address the safe conduct of fuel gas piping
17 cleaning operations. At a minimum, remove the
18 existing NFPA 54 fuel gas piping exemptions for
19 powerplants and systems with an operating
20 pressure of 125 pounds per square inch gauge or
21 more.

22 For cleaning methodology, require the

1 use of inherently safer alternatives, such as air
2 blows or pigging with air, in lieu of the use of
3 flammable gas.

4 A recommendation to the American
5 Society of Mechanical Engineer, ASME. Make
6 appropriate changes to the 2012 version of Power
7 Piping, ASME B31-1, to require the inherently
8 safer fuel gas piping cleaning methodologies
9 rather than natural gas blows. At a minimum, for
10 cleaning or flushing methods discussed in B31-1,
11 paragraph 122.10, require the use of inherently
12 safer alternatives, such as air blows and pigging
13 with air, as the motor force in lieu of the use
14 of flammable gas.

15 The next set of recommendations that
16 are proposed is to the following turbine
17 manufacturers -- General Electric, Siemens,
18 Solar, Mitsubishi Power Systems, Pratt & Whitney,
19 and Rolls Royce. Provide to your customers
20 comprehensive technical guidance on inherently
21 safer methods for cleaning fuel gas piping, such
22 as the use of air or pigging with air.

1 Comprehensive cleaning force ratio,
2 CFR, guidelines specifying both the upper and
3 lower limits required to obtain satisfactory
4 cleaning for the fuel gas piping for purposes of
5 the warranty of the turbines, and provide
6 warnings against the use of fuel gas to clean
7 pipes.

8 Also, to the same six gas turbine
9 manufacturers, work with the Electric Power
10 Research Institute to publish technical guidance
11 addressing the safe cleaning of fuel gas piping
12 supplying gas turbines. At a minimum, for
13 cleaning methodology require the use of
14 inherently safer alternatives such as air blows
15 and pigging with air in lieu of flammable gas.

16 Also, provide technical guidance for
17 the safe and effective use of alternative methods
18 for cleaning, such as air and pigging with air.

19 The next recommendation is to the
20 governor and legislature of the state of
21 Connecticut. Enact legislation applicable to
22 powerplants in the state that prohibits the use

1 of flammable gas that is released to the
2 atmosphere to clean fuel gas piping.

3 Also, adopt the current version of
4 NFPA 54, as amended, pursuant to our previous
5 recommendation related to NFPA 54.

6 The Board further authorizes and
7 directs the chairperson to send correspondence to
8 the governors of the other 49 states urging them
9 to review the Board's findings concerning the
10 explosion at Kleen Energy, the Board's
11 recommendations to Connecticut, existing state
12 regulations concerning natural gas safety, and to
13 enact any necessary changes to state regulations
14 and codes to prohibit the release of natural gas
15 to the atmosphere during pipe cleaning operations
16 at powerplants and other similar facilities.

17 And, finally, the last set of
18 recommendations, to the Electric Power Research
19 Institute, EPRI. Work with the six turbine
20 manufacturers we have identified to publish
21 technical guidance addressing the safe cleaning
22 of fuel gas piping supplying gas turbines. At a

1 minimum, for the cleaning methodology, require
2 the use of inherently safer alternatives, such as
3 air blows and pigging with air, in lieu of
4 flammable gas.

5 Also, provide comprehensive technical
6 guidance on inherently safer methods for cleaning
7 fuel gas piping such as the use of air or pigging
8 with air.

9 In summary, the CSB staff concludes
10 that these recommendations are necessary on an
11 urgent basis due to the fact there will be 125
12 powerplants commissioned before 2015. Each of
13 these plants will perform some type of fuel gas
14 piping cleaning activity. There is currently
15 limited safety guidance on pipe cleaning
16 methodologies, and the CSB does not want any of
17 these facilities to experience the same
18 catastrophic event that occurred at the Kleen
19 Energy facility in February.

20 We have learned that several
21 powerplants are still planning to perform, or
22 have already performed, natural gas blows

1 following the Kleen Energy explosion. The
2 release of such a large quantity of natural gas
3 is extremely hazardous, in that it presents the
4 potential for an explosion in a work area.

5 This practice introduces an
6 unnecessary risk to workers when others -- when
7 other inherently safe pipe cleaning methods are
8 available, such as performing air blows. The
9 venting of large quantities of air does not
10 create a fire or explosion hazard.

11 I want to thank the investigation team
12 here at the table, and also investigators back in
13 Denver and in Washington, D.C., who have been
14 extremely helpful, the rest of the staff at the
15 Chemical Safety Board, and the Board itself, and
16 we will now take questions from the Board on the
17 recommendations.

18 Thank you.

19 CHAIR MOURE-ERASO: Are there any
20 questions from members of the Board on the
21 recommendations? I remind the Board also that
22 when we have our discussion on the vote that

1 there will be an opportunity to discuss, again,
2 questions and recommendations. So, please go
3 ahead.

4 MEMBER GRIFFON: Yes. Just one
5 question, Don. And, actually, it kind of comes
6 off your summary that air blows would not prevent
7 a flammable environment. I'm looking at the
8 recommendation for OSHA Part A. It says,
9 "Prohibit the release of flammable gas," and I'm
10 wondering why not prohibit the use of flammable
11 gas.

12 And if you actually had that as
13 Recommendation A, Recommendation C would go away.
14 You wouldn't have to worry about working with
15 CGI, combustible gas indicators, to measure your
16 LELs and evacuate, and etcetera. So 'm just
17 curious, why not use there?

18 INVESTIGATOR HOLMSTROM: To explain
19 the nuances there, first of all, the intent of
20 that recommendation, the first one about release
21 to the atmosphere, is the recognition that some
22 companies use flammable gas but do not release it

1 into the atmosphere. They use it in a closed
2 system where flammable gas is recirculated with,
3 say, the use of a pig and the debris is captured
4 and flammable gas is not released to the
5 atmosphere.

6 Obviously, flammable gas is flowing in
7 these pipes during the operation of the
8 powerplant. So the existence of flammable gas in
9 the pipes is not the hazard that we are seeking
10 to address. The hazard we are seeking to address
11 is the release to the atmosphere where a large
12 amount of gas can be present and cause an
13 explosion.

14 Another alternative would be use of a
15 flare. We are aware of at least one company that
16 uses a flare to safely combust the gas prior to
17 the release to the atmosphere, so there is no
18 release of gas to the atmosphere, but, rather,
19 release of products of combustion, if you will,
20 from the flare, and flares have been used -- in
21 use for some time in a number of industries.

22 As to the issue about the percentage

1 of the LEL, one of the differences between the
2 purging situation in ConAgra where gas was purged
3 indoors in the vicinity of workers and ignition
4 sources, and there was a horrible explosion,
5 killed four people and injured a large number of
6 others, is that compared to Kleen -- in Kleen,
7 there was a planned activity where you had your
8 choice of medium to move to clean the pipe with.
9 Before you engaged in the activity, you could
10 choose gas, you could choose air, you could
11 choose nitrogen. You didn't have to use one or
12 the other; you had a choice.

13 Unlike Kleen, when you are purging
14 lines, if you have, let's say, a natural gas line
15 in a facility that goes to an appliance that is
16 already filled with gas, and a purging is
17 typically where you replace one gas with another
18 -- for example, you replace flammable gas and
19 release it -- and replace it with nitrogen,
20 because you are trying to remove the hazardous
21 material prior to opening the piping or the
22 equipment.

1 In that case, you have to get rid of
2 the gas, and in the ConAgra situation, where our
3 recommendation said, "Don't do it indoors where
4 you can -- it can lead to horrible explosion,"
5 and there is a proximity in that case of 300
6 workers that were in the building, there was
7 serious structural collapse that actually
8 resulted in three of the four fatalities, and
9 most of the injuries.

10 And so, in that case, we think it is
11 very much important to not expose workers to a
12 flammable atmosphere, send it to the outside, and
13 any time you are releasing gas to the outside do
14 it to a safe location away from workers. In that
15 case, you have to do -- you have to release the
16 flammable gas, and you can release it to a flare.
17 That's another alternative.

18 But if you release it to the
19 atmosphere, use combustible gas detectors. Do
20 not subject workers to flammable atmospheres. So
21 I hope that distinction helps.

22 MEMBER GRIFFON: Thank you.

1 CHAIR MOURE-ERASO: Any other
2 observations or comments to --

3 MEMBER WRIGHT: Yes, Mr. Chair. I
4 have a couple of questions, and you may or may
5 not be able to answer these. And I appreciate
6 that, because they focus on NFPA. But you may
7 have some knowledge and be able to enlighten me.

8 Do you have any idea why they exempted
9 the power industry from NFPA 54 in the first
10 place?

11 INVESTIGATOR HOLMSTROM: We have met
12 with NFPA, the senior staff of NFPA, on several
13 occasions, and we have asked that question. I
14 don't think they are quite clear themselves on
15 why that exists. There certainly is not a
16 commonly understood and accepted rationale within
17 the NFPA why the exception exists that is
18 currently defended. We did not hear that.

19 We heard, "Well, it has been in
20 existence since I think the period of the 1970s,"
21 and we are not quite clear how that got into our
22 standard, but they did indicate there is likely

1 resistance to eliminate it.

2 MEMBER WRIGHT: Also, I believe the
3 exemption addresses the psig, pounds per square
4 inch gauge of the material that NFPA 54
5 addresses. Is that correct? Less than or equal
6 to 125 psig?

7 INVESTIGATOR HOLMSTROM: Right. There
8 is -- for systems that are I think 125 pounds or
9 greater, there is an exemption in NFPA 54.

10 MEMBER WRIGHT: And I suspect they did
11 that because they don't have the expertise maybe
12 for 650 pounds of psig? I'm just guessing,
13 because I don't know. I'm curious.

14 INVESTIGATOR HOLMSTROM: I think
15 that's a good question. I think certainly within
16 NFPA as a whole, as you are probably aware, they
17 have many, many standards, probably several
18 hundred standards. Many of them have
19 representatives from large-scale industries and
20 powerplants who are on those committees who I do
21 think have that expertise. And whether or not
22 that particular committee would have that

1 expertise I think would be a question for further
2 research, but I think it's a good one.

3 MEMBER WRIGHT: Well, I guess I would
4 preface that by wondering why we were so specific
5 in telling them which publication to insert this
6 language in. And as you know from the ConAgra
7 case, I am against very prescriptive
8 recommendations to people, and I think it is very
9 presumptuous of us to say that this really needs
10 to be addressed in that particular publication.

11 My druthers are that I would rather
12 see us identify a gap in their coverage for
13 recommended practices, and that is basically what
14 they published in the NFPA, and say, "Hey,
15 nowhere do you really address the need for
16 purging of gas lines for these particular types
17 of facilities. Recommend that you address those
18 to prevent future incidents, such as those that
19 we have observed at Calpine and Kleen Energy."
20 And let them, as the expertise in this area,
21 decide where that best fits in terms of what
22 publication they need to address that at. And so

1 my position hasn't changed there.

2 And I guess one of my questions -- did
3 we focus on NFPA 54 because of the ConAgra case?

4 INVESTIGATOR HOLMSTROM: That is a
5 good question. We met with NFPA initially, and
6 we were in inquiry mode. You have several
7 standards here. You have NFPA 54 that deals with
8 the Fuel Gas Code and fuel gas piping safety, you
9 have NFPA 37 that addresses gas turbines, and you
10 have NFPA 850 that addresses electric power
11 generation facilities. And we walked through
12 each one of those standards.

13 In the initial meeting we had, which
14 lasted a good, long while, a couple of hours,
15 going through all of the standards and
16 questioning them, we learned the following. We
17 learned that they believed at that point in time
18 that NFPA 54 would be the likely home of a
19 recommendation that results from Kleen. They had
20 appointed a task force to look into the issue,
21 and that was their initial take, because NFPA 54
22 deals with fuel gas piping to an appliance. And,

1 in this case, there was an appliance, a gas
2 turbine, and fuel gas piping was going to the
3 appliance. And while it didn't address using
4 natural gas or gas blows to clean fuel gas
5 piping, it seemed to be the logical home.

6 The biggest problem that they later,
7 I think, learned and developed an understanding
8 about was potential resistance within their own
9 committee in 54 to the scoping issues, the
10 scoping issues being the power plant exemption,
11 and also the exemption for systems above 125
12 pounds PSIG.

13 They had other reasons why the other
14 standards were not particularly useful either,
15 one of which rated 50, although it's only a
16 recommended practice and not mandatory in any
17 jurisdiction, when they talked about fuel gas
18 piping it referenced 54, even though 54 exempts
19 power plants, so that was hard to understand.
20 They admitted that was a contradiction, and was a
21 significant issue.

22 Finally, I think the other very

1 compelling issue is that NFPA 54, which they
2 believed, at least initially, was the likely home
3 for such a recommendation, has been adopted by 35
4 states. Now, not all of those states have
5 adopted the current version of NFPA 54, and it
6 doesn't mean that if we make recommendations or
7 changes to the current version that it will
8 automatically translate into changes to all of
9 the states codes, building and fire codes, but it
10 has a lot more traction. It will create
11 significant, if it's adopted in that particular
12 standard, it will create a lot more immediate
13 change, which we, obviously -- all of us think is
14 important to change these practices.

15 MEMBER WRIGHT: And, finally, I'd just
16 like to applaud you for your recommendation to
17 the manufacturers of turbines, because from my
18 perspective, that is really where we get to the
19 issue of trying to get immediate results for our
20 recommendations. Apprizing them, and making them
21 aware of the issue here, and influencing them to
22 influence the builders of these facilities not to

1 use natural gas in this particular way. And I
2 think that is an excellent recommendation, and I
3 think it is also echoing the comments made this
4 morning at the Subcommittee hearing from
5 Education and Labor, where the judge who was in
6 charge of the Connecticut Commission said that he
7 could get immediate results based upon some of
8 the recommendations he had proffered. And I
9 think we're going to get more bang for our buck
10 not only there, but also in providing letters to
11 the other states that are going to implement
12 these things.

13 The reason I say that over, say, a
14 federal regulation, is that the majority of these
15 plants are going to be constructed in the next
16 five years, and if I'm not mistaken, it's
17 certainly going to take OSHA well over five years
18 to develop a standard to address this, or least
19 it's taken them a while to address other
20 standards that we've requested of them. But I
21 applaud you for that, and I think that's a very
22 well sounded and based recommendation. Thank

1 you.

2 INVESTIGATOR HOLMSTROM: Thank you.

3 CHAIR MOURE-ERASO: I would like to
4 add a comment. I hope that Mr. Wright agrees
5 that there are different views, even among the
6 Board, about these issues, and that you probably
7 will excuse me if I probably disagree with some
8 of the statements that you just made. And,
9 specifically, I think it's overly optimistic to
10 have expectations that NFPA will be addressing
11 the gap simply by pointing them out to them. I
12 do believe that in this particular case in NFPA,
13 a more prescriptive approach, more specifics are
14 required for addressing those gaps, rather than
15 simply pointing them out. This is kind of my
16 view, and my experience on trade associations.
17 That's a comment.

18 MEMBER WRIGHT: Okay.

19 CHAIR MOURE-ERASO: Any other
20 questions from the Board? Okay. At this time, I
21 would like to move into the Panel portion of
22 tonight's meeting. We have two panels. The

1 first panel that we have that I go to is the --
2 the panelists will sit in the table in front of
3 us.

4 The first panelist is Dr. Paul
5 Amyotte, Professor of Chemical Engineering at
6 Dalhousie University in Halifax, Canada. Dr.
7 Amyotte holds a Bachelor's Degree from the Royal
8 Military College of Canada, and a Master's from
9 Queen Victoria University, and a Ph.D. from the
10 Technical University of Nova Scotia, all in
11 Chemical Engineering. He is the editor of the
12 Journal of Loss Prevention in the Process
13 Industries, and is co-author with Trevor Kletz of
14 the second edition of "Process Plants: A Handbook
15 for Inherently Safer Designs."

16 Professor Amyotte, please proceed with
17 your statement.

18 DR. AMYOTTE: Thank you, Mr. Chairman.
19 Is someone turning these on? Okay. I don't see
20 a button. Can you hear me all right?

21 Mr. Chairman, Members of the Board,
22 ladies and gentlemen, I'd like to begin by

1 expressing my condolences to the families of the
2 men who died as a result of the Kleen Energy
3 Natural Gas explosion, and to all who have been
4 adversely impacted by this event. I also want to
5 thank the U.S. Chemical Safety Board for the
6 opportunity to be here this evening, and to give
7 this presentation.

8 I would ask that the full text of my
9 written submission be entered into the record of
10 this public hearing.

11 There are two main points I wish to
12 make. First, I will comment on the CSB
13 investigation team's urgent recommendations from
14 the perspective of inherent safety. And, second,
15 I will comment on the general use of the language
16 of inherent safety by the CSB in its
17 investigation reports.

18 On the first point, I wholeheartedly
19 support the recommendations relating to
20 inherently safer alternatives to natural gas
21 flows for pipeline cleaning. On the second
22 point, I commend the Chemical Safety Board for

1 its use of inherent safety terminology, and I
2 strongly encourage the Board to continue such
3 usage in its investigation reports.

4 A good explanation of inherent safety
5 is given in Item 33 of the Urgent
6 Recommendations. Briefly, inherent safety is a
7 proactive approach in which hazards are
8 eliminated or lessened, so as to reduce the risk
9 with both engineered or add-on devices, or
10 procedural intervention.

11 The principles of inherent safety work
12 in conjunction with other means of reducing risk,
13 namely, passive and active engineered safety, and
14 procedural safety, within a framework that's
15 commonly known as the hierarchy of controls.
16 Inherent safety being the most effective and
17 robust approach to risk reduction sits at the top
18 of the hierarchy.

19 It is followed in order of decreasing
20 effectiveness by passive engineered safety
21 devices, such as explosion relief vents, then
22 active engineered safety devices, such as

1 automatic fire suppression systems, and, finally,
2 procedural safety measures, such as ignition
3 source control by hot work permitting, for
4 example. So, inherent safety is not a standalone
5 concept. As I just described, inherent safety
6 works through a hierarchical arrangement in
7 concert with engineered and procedural safety to
8 reduce risk.

9 Inherent safety is not, however, a
10 panacea for all hazards, and all risks, nor does
11 the hierarchy of controls invalidate the
12 usefulness of engineered and procedural safety
13 measures, quite the opposite. The hierarchy of
14 controls recognizes the importance of engineered
15 and procedural safety by highlighting the need
16 for careful examination of the reliability of
17 both mechanical devices and human actions.

18 The CSB Urgent Recommendations arising
19 from the Kleen Energy explosion well address
20 these features of inherent safety. One sees
21 evidence of the use of the hierarchy of controls
22 in the recommendations being made to the

1 Occupational Safety and Health Administration.

2 These recommendations incorporate, first,
3 elimination of the fire and explosion hazard by
4 prohibiting the release of flammable gas to the
5 atmosphere for the purpose of cleaning fuel gas
6 piping through to the use of combustible gas
7 monitoring, and, finally, the development of
8 flammable gas safety procedures and training.

9 Item 33 in the Urgent Recommendations
10 invokes the inherent safety principle of
11 substitution in the case of replacing natural gas
12 with a less hazardous gas, such as air, in the
13 cleaning of fuel gas piping. I would suggest
14 that the principle of simplification is also
15 relevant here in helping to ease the complex
16 requirements for discharge design when using
17 natural gas for pipeline cleaning. And these are
18 noted in Item 31 of the Urgent Recommendations.

19 Item 64 addresses the issue of whether
20 alternative cleaning methods are technically
21 feasible by commenting that safer alternatives,
22 such as air, are just as effective as natural gas

1 for cleaning fuel gas piping. The facts that
2 inherent safety implementation is hazard-
3 specific, and is not a cure for all safety
4 issues, are recognized in Items 19 and 24 of the
5 Urgent Recommendations. Clear reference is made
6 to the removal of fire and explosion hazards by
7 the use of alternative cleaning methods, such as
8 pigging with air or nitrogen, air, nitrogen, or
9 steam blows in cleaning with water or chemicals.
10 New hazards may be introduced, however, as noted
11 in Item 23 of the recommendations, in which the
12 asphyxiation hazard of nitrogen is identified.
13 One would also have to recognize that even the
14 use of a seemingly benign substance, such as air,
15 entails propelling a gas through a pipeline under
16 some pressure. This further illustrates the
17 importance of having an effective safety
18 management system with management of change as a
19 key system element.

20 Turning very briefly to the general
21 matter of inherent safety terminology in CSB
22 investigation reports, I am heartened by the

1 continuing trend of increased usage. One clearly
2 sees the inherent safety concept and principles
3 front and center in the Urgent Recommendations
4 under discussion this evening. Looking at
5 completed investigations, I would cite the
6 Inherent Safety Analysis given in both the BP
7 Texas City Report, and the Valero McKee Refinery
8 Report.

9 One often hears the comment that
10 inherent safety is common sense, but what may be
11 common sense to some, is simply unknown to
12 others. Our goal must, therefore, be to insure
13 that inherent safety becomes common knowledge so
14 that it can become common practice, not just for
15 those knowledgeable in the fields of process
16 safety and occupational safety, but for all plant
17 personnel, all business managers, all regulators,
18 and the general public.

19 The CSB investigation reports have a
20 key role to play in bringing inherent safety into
21 the mainstream of industrial practice by serving
22 as valuable case studies of lessons learned.

1 In conclusion, I fully concur with the
2 Kleen Energy Urgent Recommendations, and I
3 encourage the CSB to continue the explicit
4 incorporation of inherent safety considerations
5 in its incident investigations, and reports.

6 Although I would not normally use the word
7 "unsafe", preferring instead to say "less safe,"
8 I do agree with the statement made in Item 60 of
9 the recommendations, "From a fire and explosion
10 perspective, releasing large volumes of natural
11 gas in the vicinity of workers or ignition
12 sources is, indeed, inherently unsafe."

13 To paraphrase Professor Trevor Kletz
14 in his landmark paper on Inherent Safety titled,
15 "What You Don't Have Can't Leak," what you don't
16 have, can't explode. Thank you, Mr. Chairman.

17 CHAIR MOURE-ERASO: Thank you very
18 much, Dr. Amyotte. We'll continue immediately
19 with our second panelist, Mr. Ervin Patterson.

20 Mr. Patterson is currently a Staff
21 Manager for major power utility in the Southwest
22 with responsibility for all startup and

1 commissioning activities within the company's
2 portfolio. He has extensive experience in the
3 power industry, including startup and
4 commissioning, plant management, and all phases
5 of plant operation.

6 Mr. Patterson, please proceed with
7 your statement.

8 MR. PATTERSON: Thank you, Mr.
9 Chairman. I also would like to thank the Board
10 Members of the Chemical Safety Board for allowing
11 me to speak here today, tonight. And on behalf
12 of my wife, my daughter, and myself, I would like
13 to offer our condolences to the family members of
14 the workers that lost their lives in an industry
15 that I, myself, work in every day.

16 CHAIR MOURE-ERASO: Could you pull the
17 microphone closer to your mouth, please?

18 MR. PATTERSON: I'm sorry. Is this
19 better? Okay. Thank you.

20 My presentation tonight will be on
21 alternative methods to insure proper cleaning of
22 fuel gas piping. There are several alternative

1 methods today for insuring the cleanliness of
2 fuel gas piping that I have found to be much
3 safer, and more efficient than the use of natural
4 gas, which until the last few years had been the
5 standard method across the industry.

6 I recommend, and use a combination of
7 methods in my startup projects which insures
8 safety foremost by, one, using alternative means
9 for cleaning, which is nitrogen; two, reducing
10 duration or time involvement; and, three,
11 reducing the number of blows required. This
12 combination will achieve the end product of clean
13 piping in a safer and more efficient manner.

14 First would be design specs. The
15 first step to achieving the desired outcome of
16 clean fuel gas piping with a reduction in time
17 and number of blows involve the design specs at
18 the engineering fabrication level. Fuel gas
19 piping can be speced out to be pickled, which is
20 coated piping to prevent corrosion at the
21 fabrication shop, which will reduce the
22 opportunity for the pipe to corrode during

1 construction phase. This will reduce the amount
2 of debris that will have to be removed during the
3 pipe cleaning process, which results in decreased
4 number of blows required to achieve the required
5 cleaning criteria. Thus, risks have been
6 eliminated and minimized at initiation of the
7 project through design and engineering,
8 especially if fuel gas is to be used as the
9 medium.

10 Next, the Build It Clean Program. The
11 next step to insure a shorter duration of pipe
12 cleaning blows is to develop a Build It Clean
13 Program within the Construction QA/QC Department.
14 This program should mandate that the piping
15 remain capped once received at site until the
16 installation process begins. The Build It Clean
17 Program should dictate that all piping will be
18 hand-cleaned, inspected, and documented by a
19 QA/QC document as it is being installed. This,
20 also, will lead to shorter duration of final
21 cleaning requirements, again, minimizing risk
22 during the blows right from the beginning of the

1 project.

2 Next is pigging, as you've already
3 heard discussion on. Once the fuel gas piping is
4 installed, the underground portion, which is more
5 susceptible to corrosion due to condensation that
6 will develop in that portion of the pipe, the
7 pre-cleaning method of pigging can be used to
8 remove the majority of this corrosion in the
9 underground section of the pipe. This should be
10 performed just prior to final pipe blows. And,
11 again, this will shorten the duration of the
12 final cleaning, thus, minimizing risk, again.

13 Nitrogen. As for the actual piping
14 blows that are required to meet the final OEM
15 cleaning criteria, I have found that utilization
16 of Nitrogen will provide the same results as
17 using natural gas as the media to perform this
18 function.

19 First, you must insure the fuel gas
20 supplier is delivering clean dry gas to your
21 site. This is done by reviewing and witnessing
22 their cleaning procedures, and cleaning process.

1 For the on-site piping, nitrogen along with a
2 temporary pump station is used to pack the pipe
3 with nitrogen, and then increase the pressure up
4 to the required PSI to achieve the cleaning force
5 ratio required to perform the proper blow.

6 Temporary pressure gauges, and temperature
7 gauges, along with the ultrasonic flow meter will
8 need to be placed on the piping to insure you are
9 reaching the required CFR. The CFR calculation
10 must also take into account the properties of
11 nitrogen, along with the pipe diameter and design
12 flows. Depending on the configuration of the
13 pipe layout within the site, the entire site
14 piping can be included in the cleaning process,
15 or the pipe can be broken into sections for
16 cleaning, depending on which is more economical.

17 The exit point with these blows is
18 typically at the fuel gas heater. A detailed
19 procedure must be written, reviewed, and followed
20 insuring all potential hazards are identified.

21 The actual site conditions are a prerequisite to
22 perform this activity, even if nitrogen is used

1 in the place of fuel gas.

2 As for the piping from the gas heaters
3 to the combustion turbine, this is, typically,
4 vendor-supplied stainless steel pipe, which
5 merely requires cleaning. Any loose material
6 that may have accumulated is removed. For this
7 cleaning process, a detailed procedure insures
8 each stage of piping is properly cleaned. Dry
9 compressed air provided by the on-site air
10 compressors is typically the cleaning media. CFR
11 is not required for this function, nor is fuel
12 gas required to achieve this activity.

13 As for maintenance, the purging and
14 venting of a fuel gas system that is in service
15 prior to maintenance activities requires special
16 consideration. A typical design is a low point
17 vent which will not properly disperse the fuel
18 gas during this purging activity. A safer means
19 to perform this is to route these vents to a
20 common header, and route the header vent to a
21 safe location for purging. A permanent grounding
22 device can be installed, as well as a LEL device,

1 which provides feedback to a DCS for the operator
2 to determine when the evacuation of gas is
3 complete. Depending on the configuration of the
4 fuel gas piping, two or more of these common vent
5 headers may need to be installed in the design.

6 Fuel gas. In the event that fuel gas
7 has to be used as the media for pipe cleaning, a
8 well written procedure must be reviewed and
9 followed to insure the safety of the site
10 workers, and protection of the site equipment.

11 Typically, the only staff allowed on site should
12 be those directly involved in the gas blows. All
13 ignition sources must be isolated within the job
14 site within 300 feet of the exit point. No
15 individual gas blow should last longer than three
16 minutes. You should allow 15 minutes in between
17 each individual blow, and after 15 minutes if any
18 LEL is detected within 50 foot of the exit point,
19 you should wait another 15 minutes and re-
20 evaluate.

21 The exit point must be at least 15
22 feet higher than any structure within 100 feet

1 that has the potential to contain fuel gas.

2 Proper grounds must be put into place on the exit
3 point of this vent.

4 In conclusion, based on past
5 experience, I feel that the combination of
6 methods and procedures provide a safer
7 alternative, and provide the same results to
8 achieve the required cleaning criteria. Picking
9 of the pipe at fabrication, insuring the pipe is
10 protected prior to being sent to the site,
11 maintaining the integrity of the pipe through the
12 Build It Clean Program during the construction
13 phase, and, finally, utilizing nitrogen and
14 obtaining the required CFR in lieu of gas. Thank
15 you.

16 CHAIR MOURE-ERASO: Thank you very
17 much, Mr. Patterson. Our next panelist is Larry
18 Danner from the General Electric Energy Company.

19 Mr. Danner has worked with General
20 Electric since 2000, where he's a Senior
21 Professional Engineer, and the Principal Engineer
22 for Product Safety. He's a graduate from the

1 Northrop Institute of Technology with a degree in
2 Aerospace Engineering. Mr. Danner is a Certified
3 Safety Professional in System Safety Aspects, and
4 a member of the American Society of Safety
5 Engineers, and the National Fire Protection
6 Association, where he serves on three technical
7 committees, including the NFPA 37, Standards for
8 the Installation and Use of Stationary Combustion
9 Engines and Gas Turbines. Also, I would like to
10 add that Mr. Danner is the first F-16 pilot that
11 I met in my life. He's a former F-16 pilot.

12 Mr. Danner, please proceed with your
13 statement.

14 MR. DANNER: Honorable Chairman and
15 Members of the Board, thank you very much for
16 this opportunity to speak here. And on behalf of
17 the entire GE Energy family, we wish to express
18 our condolences to those who have been affected
19 by this tragedy.

20 I'm going to speak on behalf of GE
21 Energy this evening, and hopefully give everyone
22 an appreciation for the relationships that do

1 exist. GE Energy manufactures and services power
2 generation equipment of all forms, steam
3 turbines, gas turbines, wind turbines, et cetera.
4 We primarily sell equipment to power plants, but
5 sometimes we also do get involved in the plant
6 design, construction, depending upon the
7 commercial arrangements with the customer.

8 For all projects, we do provide our
9 technical advisors, or TAs, for training and
10 details of setting up and adjusting the GE Energy
11 equipment for optimum performance. They have
12 very limited involvement in the plant
13 construction activities, overall. They're
14 usually not involved in any of the balance of
15 plant activities, which would include cleaning of
16 piping. They may review the cleanliness results
17 as mentioned during the investigator's report
18 based on actual tests, witnessing, or contractor
19 reports, but that is the extent of their
20 relationship with that.

21 We do share our recommendations on
22 pipe cleaning, and partnership in turnkey

1 projects at all times with our construction
2 contractors as part of our standard data package.
3 And those partnerships in turnkey are those
4 projects where we would actually be involved in
5 the design of the plant.

6 For all projects, the construction
7 contractor is responsible for cleaning of the gas
8 piping. Cleaning method is left to the
9 discretion of that contractor, unless on those
10 very, very rare occasions where GE Energy has
11 primary responsibility for oversight of the
12 construction. There are on occasional turnkey
13 projects.

14 Our relationship on the Kleen Energy
15 mishap. Upon hearing of this tragic explosion,
16 we initiated an internal review the morning of
17 February 8th, the day after the accident. This
18 review was undertaken even though GE Energy had
19 no involvement in the plant in order to learn as
20 much as possible about the accident from the
21 public sources, and then to review our existing
22 procedures in order to learn as much as we could,

1 and thereby put in any improvements, or
2 strengthening in light of lessons learned.

3 The review team consisted of
4 representation from throughout GE Energy business
5 units, U.S., International, our various
6 functional representatives from Engineering
7 Services, commercial, Chief Engineer's Office and
8 Product Safety. We identified those procedures
9 that did talk about gas blows, and the
10 recommendations for risk mitigation that were
11 contained in those procedures covering gas blows,
12 and recommendations regarding alternative
13 cleaning methods.

14 What we found was there are very few
15 documents that discussed cleaning methods.
16 Mostly, they specified how clean the system must
17 be. The documents that discussed releasing gas
18 as part of the cleaning process, referred to such
19 release through a vent routed to a safe outdoor
20 area.

21 With respect to pipe cleaning, we
22 found air blows had been recommended by GE Energy

1 as the first choice as early as 1999 in the
2 guidance that we could track down, that we do
3 provide to clients, partners, contractors
4 purchasing heavy-duty gas turbines. In this
5 document, the guidance specifically required an
6 outdoor release from an area separated from
7 buildings, sanitized of ignition sources, and
8 restrictions placed on personnel in the area.

9 The review team looked at the
10 information that was being made public by the
11 Chemical Safety Board investigators to find out
12 if there were any more lessons learned that we
13 might apply. Don Holmstrom, the lead CSB
14 investigator, in his February 25th public
15 statement provided critical focus to our efforts
16 to refine our gas blow procedures. GE Energy
17 considered those statements when drafting the
18 April update to GE's guidance regarding gas blow,
19 which we later provided to your investigation
20 team.

21 The revised elements included an
22 expanded list of cleaning options, air, nitrogen

1 purging, pigging, et cetera, specifically
2 defining gas blows as a method of absolute last
3 resort, and that the gas release must be routed
4 through a vent to a safe area. Expanded safety
5 analysis and documentation requirements require
6 high-level management review in advance of any
7 gas blow to confirm that there were no feasible
8 alternatives, if GE has the ability to choose the
9 cleaning method. Require concurrence for the gas
10 blow by senior GE management, if we, in fact,
11 have selection authority prior to giving
12 permission to GE staff to commit to a gas blow.
13 In other words, making it as difficult as
14 possible to get to that decision. You have to
15 prove that it's the only way to do it.

16 Where GE Energy does not have
17 responsibility for selecting the cleaning method,
18 it has established a firm policy where employees
19 shall not be present during gas blows. And
20 exception to this policy will only be granted if
21 the entity conducting the operation has
22 specifically requested such presence, provided

1 the documentation outlined in the updated GE
2 Energy guidelines, and the presence of an
3 employee is approved by the appropriate senior
4 manager following review by GE's Environmental
5 Health and Safety management. We have taken every
6 step we can to make gas blows something that will
7 not happen again under GE watch.

8 Thank you, again, for this opportunity
9 to appear today, and we look forward to
10 continuing to work cooperatively with the
11 Chemical Safety Board, and others in industry to
12 improve the safety procedures. Thank you.

13 CHAIR MOURE-ERASO: Thank you very
14 much, Mr. Danner. This is the end of Panel One,
15 so I would like to ask the members of the Board
16 if they have any specific questions for Panel
17 One.

18 MEMBER WARK: Yes. Thank you, Mr.
19 Chairman. I'd like to thank all three panelists.
20 You answered most of the questions I had, and I
21 appreciate that.

22 I do have one for Mr. Danner, and I'm

1 going to be going into unchartered territory for
2 me, but as a function of your warranty, your
3 guarantee on the turbines, do you -- would you
4 ever consider as a final step to disallow gas
5 blows under the warranty?

6 MR. DANNER: That would be a
7 consideration that I would have to take back to
8 those folks with respect to that question, sir.

9 MEMBER WARK: Okay. That's all I
10 have.

11 CHAIR MOURE-ERASO: I would like to
12 ask the investigative team if they have any
13 particular questions for the members of Panel
14 One.

15 INVESTIGATOR HOLMSTROM: I just have,
16 I guess, a follow-up to Mr. Patterson. First of
17 all, thank everybody. They were great
18 presentations. Thank you very much.

19 Mr. Patterson, can you tell us about
20 whether you think nitrogen blows are as feasible
21 and economical as gas blows? We heard, I think,
22 earlier today in a presentation that one person

1 stated that perhaps they thought nitrogen blows
2 might take 14 days compared to two days for gas
3 blows. You've done both, so can you tell us
4 about that?

5 MR. PATTERSON: Yes, sir, I can.

6 Thank you for the question. Actually, I finished
7 up two years ago a four by one project, four by
8 one combined cycle plant, as you heard Laura
9 explain earlier what that was, which is Quality's
10 project. And we performed nitrogen blows on that
11 project versus gas blows, and the outcome was a
12 fraction of the cost. And I think mainly because
13 earlier, as you stated, when you are blowing the
14 gas, typically any kind of pressure control
15 valves are left 100 percent open as not to damage
16 them. So, the flow of gas is controlled with a
17 block valve. And, typically, companies are not
18 even trying to determine what the CFR is.
19 Therefore, that leads to the large amounts of gas
20 that you described earlier that was discharged.
21 You know, just having to run a valve open that
22 discharges so much gas, so much more than is

1 needed to clean -- obtain the CFR, where in a
2 more controlled environment with nitrogen, it is
3 actually we can fill the line, just the section
4 we want to clean with nitrogen. Then we just can
5 pump it to the pressure that's required to obtain
6 the CFR, so we use a lot less media, being
7 nitrogen. Therefore, it's proved to be much more
8 economical for us, not only safer, which is the
9 main reason, but much more economical. I think
10 if you had to buy the gas to heat homes for that
11 many years, you would compare the cost.

12 CHAIR MOURE-ERASO: Do you have
13 another question?

14 INVESTIGATOR HOLMSTROM: No.

15 CHAIR MOURE-ERASO: A follow-up with
16 this. When you are -- you have experience with
17 nitrogen blow, is it possible to recover the
18 nitrogen? Could you recycle it, rather than
19 blowing it up, and reusing it again?

20 MR. PATTERSON: No, sir. And the
21 reason not is because of the required CFR directs
22 a point you have to maintain the velocity in the

1 flow. And if you try to bottle that, or capture
2 that, then you're not actually getting the
3 cleaning force ratio that's required at the exit
4 point to clean the entire piping. That is the
5 main challenge, is obtaining the CFR throughout
6 the entire pipe. Therefore, you have to have an
7 exit point that you -

8 CHAIR MOURE-ERASO: Thank you. I
9 apologize to Mr. Bresland. I didn't see, he
10 wanted to ask question to the panel. Please, Mr.
11 Bresland.

12 MEMBER BRESLAND: Thank you, Mr.
13 Chairman.

14 A question for Mr. Danner. How much
15 does a turbine cost? If I wanted to go out and
16 buy a GE turbine tomorrow to make electricity,
17 what would I pay for it?

18 MR. DANNER: Depending on the turbine,
19 it's a few tens of millions to over \$100 million,
20 depending upon the amount of equipment that
21 you're buying with it.

22 MEMBER BRESLAND: So, it is a valuable

1 piece of equipment that needs to be protected --

2 MR. DANNER: Yes, sir.

3 MEMBER BRESLAND: -- from dirt.

4 MR. DANNER: Yes, sir.

5 MEMBER BRESLAND: The blow that we
6 saw, the photograph that we saw of the blow, the
7 vertical blow, it seemed that there's a lot of
8 dirt in that. Is that typical?

9 MR. DANNER: That dirt, my
10 understanding of that is it's typically the dirt
11 that is -- I think that my colleague, Mr.
12 Patterson, referred to that, is the piping,
13 itself, gets interior rust and things of that
14 nature due to storage and so on, and it's blowing
15 that out. Our equipment, such as our gas heaters
16 and filters, and so on, are all detail clean and
17 provided clean to the site.

18 MEMBER BRESLAND: Okay. Thank you.

19 CHAIR MOURE-ERASO: Mr. Wright.

20 MEMBER WRIGHT: Thank you, Mr.

21 Chairman. I want to thank the members of the
22 panel, as well. Very informative.

1 I agree with Trevor Kletz. I quote
2 him quite often. However, I didn't quite catch,
3 I think it was the second page, and I wish I had
4 a copy of your statement so I could read it, and
5 maybe not have to ask you this, but I believe you
6 said provided that it doesn't interfere with the
7 process, or maybe I'll catch you afterwards and
8 read your statement.

9 DR. AMYOTTE: I commented that
10 inherent safety is not a standalone concept.
11 It's not a cure-all.

12 MEMBER WRIGHT: No, I understand that.

13 DR. AMYOTTE: As management change,
14 the whole thing, cost-effective.

15 MEMBER WRIGHT: No, I'll look at it
16 later, and then we can discuss it offline
17 properly.

18 DR. AMYOTTE: Okay.

19 MEMBER WRIGHT: Mr. Patterson, you've
20 got quite an extensive background in doing these,
21 and my question is, have you ever experienced any
22 flashing or explosions in any of the gas blows

1 that you've been associated with?

2 MR. PATTERSON: No, sir. Fortunately,
3 I have not.

4 MEMBER WRIGHT: Knock on wood, as they
5 say.

6 MR. PATTERSON: Right. Actually, I
7 was an employee of Calpine when the work scale
8 incident was referred to earlier, I was on
9 another job site, actually. And that was when we
10 took a real hard look, or, personally, I did,
11 that we need to look at alternative methods.
12 We've always tried to take extra measure to write
13 a good detailed procedure, and make sure it's
14 site safety, and worker safety, but any time
15 you're using natural gas, there's always a risk.

16 MEMBER WRIGHT: And I wish more people
17 had taken a harder look after that incident,
18 because that one didn't cost any lives, and in
19 this particular case so many years later, we
20 regretfully are here discussing this issue.

21 MR. PATTERSON: Yes, sir. We're in
22 the industry now where we're seeing more and more

1 natural gas plants being built; therefore,
2 there's more and more natural gas piping to be
3 cleaned, so the potential is there, a lot higher.

4 MEMBER WRIGHT: Absolutely. And then,
5 finally, with Mr. Danner, have you experienced
6 with any of your equipment whether you're
7 associated with the particular build or whether
8 you're just supplying equipment, any explosions
9 or fires due to gas blows?

10 MR. DANNER: Since you asked that
11 question, I will have to admit that the Calpine
12 equipment was provided by the GE Air Derivative
13 Organization, and that the earlier 2001 mishap
14 was also GE equipment. When we were notified
15 with respect to that 2001 mishap, we did an
16 internal search, and, again, it was pure
17 equipment only, we could find no record of that
18 having been reported within the GE system, so we
19 were unaware of that one.

20 MEMBER WRIGHT: And then, finally,
21 just a general statement, that I applaud the
22 efforts of General Electric here, and I hope that

1 your peers will undertake as valiant of efforts
2 that you've undertaken at this stage of the
3 development of safe procedures in installing and
4 making operational your equipment. So, my hat is
5 off to you.

6 MR. DANNER: Thank you. We do look
7 forward to working with the industry community,
8 as well as NFPA's document.

9 MEMBER WRIGHT: Thank you, Mr.
10 Chairman.

11 CHAIR MOURE-ERASO: Thank you, Mr.
12 Wright.

13 One question for Mr. Danner.

14 MR. DANNER: Yes, sir.

15 CHAIR MOURE-ERASO: Can you conceive
16 of any situation in which you will require a
17 burn-up with natural gas? I mean, you said that
18 you discourage it, but can you -- will you make
19 in any particular situation a recommendation to
20 do it with natural gas in some situation?

21 MR. DANNER: GE Energy's policy right
22 now is to not use gas to blow it. If anyone were

1 to come to us and say we need to use natural gas,
2 they would have to prove to us, and I say prove
3 to us at a senior management level that all the
4 other alternatives are technically unfeasible.
5 So, with what we know today, we do not believe
6 that to be the case that we would ever do that.
7 The door is open, but, again, the burden of proof
8 would be on the person proposing that.

9 CHAIR MOURE-ERASO: Thank you. You
10 have a comment?

11 MR. PATTERSON: I would just like to
12 add a comment to that. The company I'm involved
13 with now, we've actually issued a standing order
14 that -- because we self-perform our startup
15 activities, which is gas blows, so the company,
16 we have issued a standing order that no natural
17 gas will be used for any pipe cleaning.

18 CHAIR MOURE-ERASO: Are there any more
19 questions from the panel or the investigator?

20 INVESTIGATOR HOLMSTROM: One final
21 question for Professor Amyotte. How is natural
22 gas regulated in Canada?

1 DR. AMYOTTE: You would ask the one
2 question I really can't answer. I happen to come
3 from the eastern part of Canada, where we're sort
4 of more coal and imported oil, though we do have
5 offshore natural gas. I think you probably, Mr.
6 Holmstrom, would have to ask someone from Alberta
7 that question. But I think in terms of the
8 discussion this evening, I'm much more familiar
9 with the coal mines, although we don't have any
10 active coal mines in Nova Scotia at the present
11 time. We did have both provincially and
12 federally regulated, and I think, if I pick up on
13 the gist of your question, there are and remain
14 on the books regulations to deal with percentage
15 of the lower limit of methane at which point
16 machinery would have to shutdown, the evacuation
17 of the mines would occur, I suspect much like in
18 the United States. And those are, I believe, 20
19 percent and 40 percent of the lower limit.

20 In Nova Scotia, we do have general
21 regulations attached to our Occupational Health
22 and Safety Act, and they speak to the requirement

1 for an employer to render harmless the atmosphere
2 in a work environment, which, I believe, would
3 cover more generally the type of issue that we're
4 looking at this evening. There are also
5 regulations about no atmospheric propane releases
6 in Nova Scotia. You mentioned confined space,
7 and a percentage of LEL for flammable gas is
8 applicable there. So, I haven't answered
9 directly your question, but I think, in general,
10 and at least my part of Canada, there are
11 regulations of a sort.

12 CHAIR MOURE-ERASO: If there are no
13 more questions, I would like to thank Professor
14 Amyotte, Ervin Patterson, and Larry Danner,
15 members of Panel One. And I would like to invite
16 the members of Panel Two to proceed to the front
17 of the room so that we can continue the
18 proceedings. Thank you.

19 At this time, I would like to move to
20 the second group of panel presentations. Next, I
21 would like to introduce Representative Matthew
22 Lesser from the Connecticut State Legislature.

1 Mr. Lesser represents the towns of Middletown,
2 Durham, Middlefield, and Rockfall.

3 In 2008, Matt was elected to the
4 Connecticut General Assembly as its youngest
5 member, where he serves in the Education, Public
6 Health, Energy and Technology Committees.

7 Representative Lesser, please proceed with your
8 presentation.

9 REP. LESSER: Well, I'd like to first
10 thank the Chemical Safety Board for inviting me
11 to participate on this panel. One Sunday morning
12 in February of this year, as I was enjoying my
13 morning coffee, my windows rattled, and the
14 related explosion shook my community, the City of
15 Middletown, as well as the entire state. In the
16 hours that followed, our focus was on rescue and
17 recovery efforts. The days that followed that
18 shifted to the investigation, and then weeks
19 later supporting the victims, and the families of
20 the victims. But now our priority is making sure
21 that this never happens again, looking at the
22 results of the investigations, and incorporating

1 the lessons learned.

2 I first want to acknowledge a couple
3 of my colleagues who are here tonight. Deputy
4 Speaker Jim O'Rourke serves with me on the Energy
5 and Technology Committee. He also represents
6 part of the City of Middletown, as well as
7 Portland and Cromwell, as well as another Deputy
8 Speaker, Linda Orange of Colchester. And I know
9 they, as well as the Chairs of the Committee,
10 Senator Furfaro and Representative Nardello care
11 deeply about making sure that we learn lessons
12 from this to make sure that we have safe power
13 plants in the State of Connecticut.

14 One of the most striking lessons we
15 learned at the very outset of our efforts on the
16 legislative level was when we held a public
17 hearing on the Energy and Technology Committee.
18 We had all of the major state regulators in front
19 of us, and we asked them straight out who was in
20 charge, and we heard silence. That was striking
21 to me, personally, and I know to the other
22 members of the Committee. So, I think our first

1 priority is making sure that we do not have what
2 is, in effect, at the state level a regulatory
3 vacuum. We have local agencies in charge of
4 safety, but we have no statewide look at safety
5 in power plant construction and ongoing
6 operations. So, our first effort, we've got
7 legislative language that's currently being
8 considered up at Hartford, Senate Bill 462. And
9 the center piece of that is taking our state's
10 Department of Public Utility Control and tasking
11 it with general oversight over safety in power
12 plant construction and operations.

13 Additionally, we take the Gas Pipeline
14 Safety Unit, which is part of the Department of
15 Public Utility control, and currently oversee
16 safety for gas pipelines up until the meter of
17 the power plant. And we asked them to follow
18 behind the meter of the power plant and insure
19 safety of gas operations inside the power plant.
20 We ask that the Department of Public Utility
21 Control adopt regulations that, at a minimum,
22 they must adopt the recommendations, guidelines -

1 Urgent Recommendations, guidelines, and safety
2 recommendations of the Chemical Safety Board, and
3 we flat out ban the use of natural gas for
4 natural gas blows for cleaning operations in gas
5 pipelines.

6 Additionally, this legislation would
7 reform the Connecticut Siting Council, which is
8 tasked with examining the siting of major
9 installations, including power plants. We add to
10 their proceedings, the State Department of
11 Emergency Management and Homeland Security, and
12 the Department of Public Safety of the
13 proceedings so we can get recommendations from
14 those agencies, and that we insure that they take
15 the safety of neighbors and neighboring houses
16 and people into consideration.

17 We also have them separate the
18 approval of the power plant into two phases, one
19 for construction, and then the second phase,
20 which is for actual operation, cannot be approved
21 until they've certified the safety of the
22 construction.

1 And then, finally, I think it's
2 important to consider that all recent power plant
3 construction in Connecticut has been of natural
4 gas plants, so we ask that the Connecticut Siting
5 Council take into consideration the diversity of
6 our state's fuel mix in examining approvals of
7 new power plants.

8 There are a couple of others that are
9 of concern to this Committee, as well. One is of
10 early completion incentives, so we've asked that
11 in all new power plants that are currently being
12 constructed, or will soon be constructed, that
13 are financed in any way through state dollars, we
14 ask that the terms of those contracts here on out
15 be insured to not have any early completion
16 incentives, and that if there are any current
17 contracts that have early completion incentives,
18 that they be modified to remove them. We are
19 concerned that that might have a negative impact
20 on power plant safety, and create dangerous
21 incentives.

22 And then we also -- finally, we ask

1 that the Department of Emergency Management and
2 Homeland Security, the Department of Public
3 Safety, and the Connecticut Siting Council meet
4 at least once per year to discuss any current
5 safety issues at power plants. And, after that
6 meeting, if there are any, to notify the Governor
7 and local legislators of those concerns. I'm
8 optimistic that we will be able to have
9 legislation ready at the start of the next
10 legislative session in January 2011, and I'm
11 hopeful that we have -- I believe we have the
12 support to pass needed reforms, and am optimistic
13 about getting them through. Thank you.

14 CHAIR MOURE-ERASO: Thank you very
15 much, Mr. Lesser. Our next panelist is Glenn
16 Corbett, Associate Professor of Fire Science at
17 the John Jay College of Criminal Justice in New
18 York City, where he's also the Chair of the
19 Department of Protection Management. He's a
20 technical editor of Fire Engineer Magazine, and
21 he's a former Assistant Chief of Waldwick, New
22 Jersey Fire Department. And he has served, also,

1 as the President of the New Jersey Society of
2 Fire Services Instructor. He testified before
3 the 9/11 Commission, and recently served on the
4 Federal Advisory Committee of the National
5 Construction Safety Team that investigated the
6 World Trade Center disaster.

7 Mr. Corbett, you may begin.

8 PROF. CORBETT: Thank you, Mr.
9 Chairman, and thank you Members of the Board for
10 inviting me here today. I'd like to also add my
11 own condolences to the families and friends of
12 those who were lost in this tragedy.

13 I'd like to spend a few moment talking
14 about specifics about the code recommendations
15 that have been made. Prior to coming to John
16 Jay, actually, I spent about eight years as a
17 code enforcement official in San Antonio and
18 Austin's Fire Departments, and currently actually
19 serve on New Jersey's Fire Code Council, though
20 I'm representing only myself today.

21 The explosion at the Kleen Energy
22 plant on February 7, 2010 has exposed a large gap

1 in our national codes, in particular, provisions
2 dealing with natural gas purging, as well as
3 natural gas blow operations. This incident, in
4 addition to another explosion at the ConAgra Slim
5 Jim plant in Garner, North Carolina in 2009
6 demand that this problem be promptly and properly
7 addressed in our model codes.

8 Inherent danger of purging gas piping
9 of trapped air, for example, with natural gas is
10 obvious. While such purging operations are
11 necessary and commonly take place in small
12 installations, such as residential gas-fired
13 equipment without incident, the higher volumes of
14 expelled gas in larger commercial and industrial
15 installation presents a much greater danger to
16 construction workers and the public, in general.

17 Gas flow operations, on the other
18 hand, conducted with very high gas pressures to
19 remove trapped debris, such as slag and rust, are
20 inherently hazardous, present a significant
21 danger to workers and occupants in a facility.
22 Stringent regulations are critical to insure

1 proper safety in both of these situations.

2 As many of you are aware, our nation
3 relies heavily on the construction and safety
4 codes developed by private non-profit code
5 writing organizations, such as the National Fire
6 Protection Association, International Code
7 Council. Their codes and standards are adopted,
8 and in many cases modified by local governments,
9 states, and the federal government. The two most
10 relevant codes addressing gas purging operations
11 are the NFPA 54s have been discussed here, the
12 International Fuel Gas Code, and International
13 Code Council's International Fuel Gas Code.
14 However, again, as have been mentioned earlier,
15 electric utility plants, as Kleen Energy, are
16 outside the scoping provisions of both of these
17 codes. In addition, the high pressure gas blow
18 that was used by Kleen Energy, reportedly at 650
19 PSI, was also outside the scope of NFPA 54 and
20 the International Fuel Gas Code.

21 It's the scoping provisions of these
22 two codes that create the greatest impediment to

1 insuring worker safety in construction and
2 operation of electric utility plants who utilize
3 natural gas as a fuel. In the wake of ConAgra
4 and the Kleen Energy incidents, the NFPA issued
5 emergency temporary - excuse me - an emergency
6 tentative interim amendment to NFPA 54 changing
7 the gas purging provisions. A subsequent vote
8 was taken, the Technical Committee charged with
9 overseeing NFPA 54, which failed to meet the
10 necessary two-thirds affirmative vote needed for
11 permanent inclusion in the codes. While these
12 failed provisions were a slight improvement on
13 the previous code language, these changes would
14 have done nothing to address the scoping
15 exemptions for electric utility power plants, nor
16 would they have dealt with the dangerous gas blow
17 operations. While the International Code Council
18 has vowed to update it's 2012 edition of the
19 International Fuel Gas Code, it's unclear what
20 those changes may be.

21 At the heart of insuring a safe work
22 environment and public safety in terms of gas

1 purging, and gas blow operations is actually code
2 enforcement, the enforcement of NFPA 54,
3 International Fuel Gas Code, often lies with
4 local government, plumbing inspectors, and in
5 some cases state inspectors. However, these
6 inspectors do not, typically, inspect the gas
7 pipe discharge areas prior to purging or gas blow
8 operations, nor do they witness the actual
9 operation itself. The codes do not require that
10 inspection of gas purging operations or gas blows
11 be performed, and I also do not believe that the
12 Occupational Safety and Health Administration has
13 had a policy of inspecting gas purging or gas
14 blow operations at the time of the Kleen Energy
15 explosion.

16 I've reviewed the recommendations from
17 the Chemical Safety Board, and I am in total,
18 complete agreement with your Urgent
19 Recommendations. I would also suggest the
20 following additional recommendations. Issue the
21 same set of recommendations that have been issued
22 to the NFPA, to the International Code Council.

1 While the ICC is a participant in NFPA 54 Code
2 development process, the ICC publishes the nearly
3 identical International Fuel Code, and should be
4 presented with the same set of Urgent
5 Recommendations.

6 In addition, I suggest that the CSB
7 recommend NFPA 54 and International Fuel Gas Code
8 require that medium and large-scale installations
9 receive a permit for purging, gas purging
10 operations. Given the danger involved, I also
11 recommend this requirement also be placed in NFPA
12 1, the NFPA's Fire Code, as well as the
13 International Fire Code from the ICC. Gas
14 purging operations in medium and large-scale
15 installations should not only receive a site
16 inspection approval of a plumbing inspector, but
17 also should receive the concurrent approval of
18 the local Fire Marshal.

19 Number two, issue the same set of
20 recommendations that have been made to the NFPA
21 and to the ICC to OSHA, as well. Unfortunately,
22 I have little confidence that the NFPA or the ICC

1 will in the near term future will actually make
2 any changes that the CSB has recommended. OSHA
3 will have to take the lead to address all these
4 issues that you have identified.

5 Number three, recommend to OSHA that
6 a permit system for conducting gas purging
7 operations in medium and large-scale commercial
8 industrial occupancies be created. Regulations
9 similar to OSHA's Confined Space Lockout Tagout,
10 requirements should be developed to insure proper
11 gas purging operations in these medium and large-
12 scale facilities. A permit will insure that the
13 site of the purging operation will have been
14 inspected for proper equipment installation, the
15 necessary monitoring equipment is in place, and
16 verify the safe dispersal area has been
17 established prior to conducting the operation.

18 In closing, I wish to thank the U.S.
19 Chemical Safety Board for allowing me to testify
20 on this very important issue. I look forward to
21 any questions you may have after the rest of the
22 panelists have completed their presentations.

1 Thank you.

2 CHAIR MOURE-ERASO: Thank you very
3 much, Mr. Corbett. Our next panelist is Mr.
4 Michael Rosario.

5 Mr. Rosario is a Representative of
6 Local 777 of the Plumbers and Pipefitter Unions
7 AFL-CIO, and serves as the Business Agent for
8 Harford and Tolland counties. Mr. Rosario,
9 please proceed with your statement.

10 MR. ROSARIO: Good evening, everyone.
11 My name is Michael Rosario. I'm Business Rep for
12 Plumbers and Pipefitters, Local 777, and
13 representing the Hartford New Britain Building
14 Trades Council representing 15 trade unions
15 within the jurisdiction of the Kleen Energy
16 Plant. Our thoughts and prayers go out to the
17 families, our continuing support. We will never
18 forget what happened on that tragic day. On
19 February 7th, four pipefitters were killed in this
20 tragic set of events. Most of them were my
21 friends. All four I talked to on a weekly basis,
22 some of them I've known for over 20 years.

1 The unions, we are the most efficient
2 skilled safest workforce in the construction
3 industry. When one of our members goes to work
4 and they don't come home, it affects all of us.
5 And I take this personal, because of my
6 commitment to the people that I represent, and my
7 friends that were up on that job site that day.

8 This is our first statement that we've
9 made since the tragic set of events on February
10 7th. We've kind of sat back and made really no
11 statement, so tonight this will just be a real
12 brief statement from us.

13 We have reviewed all the information
14 that the Chemical Safety Board has provided us,
15 and we are in full support of all recommendations
16 that were set forth in front of us.

17 Every since the event happened, we
18 never knew who CSB was. I got a call from Don
19 Holmstrom the day after the event, and I was a
20 little leery about talking to him. And we had a
21 brief conversation. He was having a hard time
22 getting up on site. Myself and Ed Riley, the

1 Business Manager of the Iron Workers, and the
2 President of Hartford and New Britain Building
3 Trades Council, were up on site, and Don finally
4 had access to the site, and we met him face-to-
5 face.

6 And, like I said, we were a little
7 leery in the beginning, but once I met Don, and
8 he looked me in the eye, and he looked Eddie in
9 the eye, and we shook hands, and we sat down and
10 talked, the feeling was right. And we invited
11 them into our house, we opened up our training
12 center in Meriden, Connecticut, Murdock Avenue,
13 and we proceeded with many, many hours, countless
14 hours of interviews down at our training center
15 with the Chemical Safety Board of all the members
16 that were up on site on that day. And we also
17 conducted all the OSHA investigation interviews
18 at our training center. So, we opened up our
19 door and we welcomed CSB to our house. And we
20 just appreciate the thorough investigation that
21 everyone has provided for us, all the information
22 that we got. And we really appreciate this.

1 We can't allow this to happen again.
2 I will take whatever it takes, and I'm asking
3 everybody behind me that's a resident of
4 Connecticut, that you help us and follow us up to
5 the Capitol to make sure that this doesn't happen
6 again. We have a chance right here, right now to
7 make a difference. If we rely on OSHA, and NFPA
8 to change the regulations, it could take five to
9 ten years. We have a chance to follow us up to
10 the Capitol and talk to all our representatives
11 in our area, and get this passed through, and
12 make it a law here. We could be the star of the
13 United States in changing this.

14 I wouldn't be able to sleep, myself,
15 if I didn't come here tonight. I needed to come
16 here, because those people were my friends. Not
17 only am I there representative, but they were my
18 friends. And we can't allow their names just to
19 fade away. The longer we wait and time goes by,
20 everyone will forget. We will never forget. The
21 trade unions are here, we built America, we'll
22 continue to build America. And I'm asking

1 everybody in this room to follow us, because the
2 trade unions, we will be up at the Capitol
3 pushing legislation, and making sure that all
4 these recommendations that will be forwarded to
5 Jody Rell are enacted and put into law. Thank
6 you.

7 CHAIR MOURE-ERASO: Thank you, Mr.
8 Rosario. I would like to also make a comment,
9 that the welcoming that your organization have
10 provided to CSB has really facilitated the
11 conduction of a good investigation here. And the
12 same wishes, and feelings of welcoming that you
13 have for us, we in CSB have for you and your
14 organization.

15 The next panel member is Mr. Steven
16 Schrag, who serves as the Co-Chair of the
17 Connecticut Council on Occupational Safety and
18 Health, ConnectiCOSH. ConnectiCOSH is a non-
19 profit statewide organization which help unions,
20 individuals, and communities with healthier and
21 safer working and living conditions. Mr. Schrag,
22 you may begin your statement.

1 MR. SCHRAG: Thank you. Good evening.
2 My name is Steve Schrag, and I'm a Co-Chair of
3 the Connecticut Council on Occupational Safety
4 and Health. Like others, we want to extend our
5 condolences to the families and friends of those
6 who were killed, to know that we will keep them
7 in our prayers. And I want to thank the CSB for
8 the opportunity to speak tonight.

9 The Kleen Energy Gas Plant explosion
10 raises many issues of concern to us. It's part
11 of the daily toll of 16 workers who do not come
12 to their families due to death on the job. This
13 is unacceptable. We appreciate the role that the
14 Chemical Safety Board plays in conducting root
15 cause investigations of chemical accidents at
16 fixed industrial facilities. The CSB root cause
17 analysis will yield valuable information that can
18 lead to the prevention of this unnecessary
19 tragedy from occurring again.

20 After reviewing the preliminary
21 analysis of the Middletown explosion, there are a
22 couple of points that strike us as important.

1 The first point is that there was no safety
2 meeting held on the day of the incident to
3 specifically discuss the hazards of natural gas
4 blows. Ongoing training and communication with
5 workers is crucial to insuring that proper
6 procedures are followed.

7 There is always pressure to increase
8 worker productivity, and the only way that worker
9 safety is part of the calculation is when workers
10 are regularly informed by supervisors about the
11 safe way to do the job. This sends a signal that
12 the supervisor's is expecting them to do the job
13 safe, not just quick.

14 The second point that concerns us was
15 that inconsistent instructions were issued with
16 some contractors continuing to work inside the
17 generation building during the natural gas blow.
18 If all of the workers involved with those
19 activities had been properly notified that a gas
20 blow was being conducted, they would have been
21 evacuated, and the activity discontinued. It is
22 crucial that there be a line of authority

1 regarding what activities should happen during
2 potentially dangerous operations. Clear
3 procedures issued by those with authority lead to
4 safer work places.

5 I coordinate the SCIU Eastern Region
6 HAZMAT program, and work to establish training
7 and education in work places. Training is
8 essential to help workers understand the
9 seriousness of the hazard that they face.

10 However, it is not possible to reduce their
11 exposure to health and safety risk through
12 training alone.

13 Years ago, I worked with one of our
14 bargaining units who represented highway workers.
15 They used air guns to blow out brake linings
16 during brake jobs on trucks. This created
17 airborne asbestos, which put everyone in the
18 garage at risk. We were told that they had done
19 this job this way for 25 years, and would not
20 change their operations easily. We conducted
21 workshops, we brought info to their attention
22 about the damage to their health, but we also

1 described the tool that could help protect them
2 while doing their work. We were successful in
3 convincing management to buy these tools, and
4 after their introduction to the workplace,
5 supervisors and front line workers self-policed
6 to make sure everyone used it properly. The
7 information helped, but alone it was not enough.
8 Proper tools and clear procedures were just as
9 important.

10 Given that there have been several
11 other similar gas explosions since 1997, one
12 solution to this hazardous operation is to
13 establish a federal regulation requiring a system
14 of safety-type standard. This could be modeled
15 on the process safety management regulation.

16 ConnectiCOSH has worked for
17 requirements that encourage use of safer cleaning
18 chemicals, and substitution of safer chemicals
19 and other work process, and we advocate that a
20 requirement that employers look for and use safer
21 technologies, and materials as another means of
22 reducing gas blow dangers. However, whatever

1 regulatory changes that are made will not be as
2 useful unless there is accountability to comply
3 with them. There needs to be a mechanism to
4 insure that the corporate officials at the
5 highest levels make health and safety a priority.

6 Currently, the federal law Sarbanes-
7 Oxley, requires that CEOs take personal
8 responsibility for all accounting and audit
9 documents. A workplace environmental version
10 could require the CEOs to sign-off and take
11 personal responsibility for adequate safety and
12 health programs.

13 Another proposal is to require hazard
14 monitoring be conducted by an independent
15 industrial hygienist, or safety personnel on
16 site, like a fire marshal, or other non-employee
17 of the responsible corporation in order to reduce
18 potential conflict of interest problems.

19 And, finally, for those corporations
20 who have a track record of non-compliance with
21 health and safety regulations, eligibility for
22 tax breaks, contracts, or other public resources

1 should be prohibited. We should not reward bad
2 behavior with public money. We need a corporate
3 ethics regulation.

4 Unfortunately, history shows that
5 workers do not get protections from hazards until
6 there are deaths, the Triangle Shirtwaist Factory
7 fire, Gauley Bridge silica exposure, and
8 Farmington, West Virginia mine collapse. We
9 intend to make sure that these workers that died
10 in Middletown did not die in vain, and we will
11 organize until serious and substantial change to
12 protect workers from these hazards on the job is
13 enacted. Thank you for your time and
14 consideration.

15 CHAIR MOURE-ERASO: Thank you, Mr.
16 Schrag. I would like now to ask if there are any
17 questions from Members of the Board, or the
18 investigative team of Panel Two.

19 MEMBER BRESLAND: A question for
20 Representative Lesser. Just quickly, what is the
21 status of the recommendations that were made by
22 the Governor's Panel as a result of the accident?

1 REP. LESSER: My understanding, there
2 are two panels. There is the Nieves Commission,
3 and then there is the Thomas Commission. The
4 Nieves Commission has released the findings -
5 released its findings recently. The Thomas
6 Commission is now making recommendations now for
7 action based on the Nieves Commission's
8 investigations into what caused the disaster.
9 Now, we're waiting word on what the Thomas
10 Commission recommends, and what actions to take
11 to make sure that that never happens again. On
12 the Energy and Technology Committee, we will
13 review the findings of both panels, and look at
14 them very closely, as we look at a legislative
15 action to take.

16 MEMBER BRESLAND: One of the
17 recommendations we're making to the State of
18 Connecticut is that they enact legislation to
19 prohibit the use of flammable gas to clean fuel
20 piping. What's the likelihood of that passing in
21 the State?

22 REP. LESSER: Well, I'm no soothsayer,

1 but it was in our legislation, the Senate Bill
2 462, this past legislative session. I think
3 there's strong support for that on the Committee,
4 and the House, and the Senate, in general.

5 MEMBER BRESLAND: Okay. Thank you.

6 CHAIR MOURE-ERASO: I would like to
7 make some comments before releasing Panel Two.
8 I, especially, would like to thank Professor
9 Glenn Corbett for his statement, and his work in
10 this field. I know that he's second time in the
11 day that he goes through this process. He
12 presented testimony this morning in the House of
13 Representatives here, and we appreciate you
14 coming here, and also talking to us this
15 afternoon.

16 Also, I would like to observe that Mr.
17 Lesser, and Mr. Rosario, and Mr. Schrag are
18 representatives of the community of Middletown,
19 and the people of Connecticut. And we are very
20 glad that to have the community come and talk to
21 us, and participate in these proceedings.

22 Our next statement, or next part is

1 public comments. And we have a list with a few
2 persons that are going to be presenting comments.
3 We would like to -- the person that comes to
4 present comes to the microphone to give us their
5 name and their affiliation, and we very much
6 request that you limit your comments for three
7 minutes. You should do this in consideration to
8 your other fellow persons commenting that also
9 have three minutes.

10 The first person to present comments
11 is going to be comments from the O&G Industry,
12 Incorporated to the Chemical Safety Board that
13 were submitted to us through the mail. And I
14 have asked Chris Warner, our Chief Counsel, to
15 read those comments. So, Mr. Warner, please.

16 MR. WARNER: Thank you, Mr. Chairman.
17 I will read O&G comments that have been submitted
18 to the Board.

19 "We would like to thank the Chemical
20 Safety Board for the professionalism and
21 sensitivity it demonstrated during its
22 investigation of the tragedy that occurred at the

1 Kleen Energy site on February 7, 2010. O&G
2 welcomed the CSB's arrival to the Kleen Energy
3 site in February, as it did OSHA, the Middletown
4 Fire Marshal's office, Middletown Fire and Police
5 Departments, and the Connecticut Department of
6 Public Safety. O&G fully cooperated with all of
7 these investigative agencies, so that industry
8 procedures and standards could hopefully be
9 developed to avoid a devastating event of this
10 type from ever occurring again. We ask everyone
11 to again join us in remembering those that lost
12 their lives, or were injured. These individuals
13 and their families, friends, and coworkers remain
14 in our thoughts and prayers.

15 O&G utilizes contractors that employ
16 current industry standards in their specialized
17 work. However, when those standards can be
18 improved, they should be. And companies like
19 O&G, who seek to stay at the forefront of
20 industry safety, should immediately and
21 enthusiastically require their subcontractors to
22 adopt those improvements that may make a job

1 safer.

2 The recommendations raised for
3 consideration by the Board today include
4 utilizing substances other than natural gas for
5 the cleaning of fuel gas piping. O&G supports
6 this recommendation, and its subcontractors will
7 not be utilizing natural gas to clean the fuel
8 gas piping when that stage of construction is
9 reached during the rebuilding of the Kleen Energy
10 plant.

11 O&G is currently exploring appropriate
12 alternatives and is most appreciative to Dan
13 Tillema of CSB's investigative team for his
14 assistance in this regard. O&G also supports the
15 formulation and adoption of regulations and
16 standards to specifically govern the construction
17 activities of this type that will have the
18 desired effect of a deep and long-lasting
19 positive impact on overall job site safety.

20 We are proud to support the
21 recommendations made by Don Holmstrom's
22 investigative team who devoted a tremendous

1 amount of time and energy to thoroughly examine
2 the events of February 7th, and we express our
3 sincere hope that they are adopted by the Board.
4 However, whether adopted or not, O&G will,
5 itself, implement these recommendations to the
6 fullest extent possible. O&G will continue to
7 work with the Chemical Safety Board, and other
8 federal and state agencies, as well as union
9 workers, contractors, and other industry
10 specialists to improve construction practices
11 with a goal of creating safer work sites." End
12 of the statement.

13 CHAIR MOURE-ERASO: Thank you. I have
14 on my list here of people that have put for
15 comment, Mr. Evan Yates for the United Food and
16 Commercial Workers. I see him approaching to the
17 microphone.

18 MR. YATES: Good evening. I'd like to
19 thank the CSB for allowing me this opportunity to
20 comment, and I'd like to offer the thoughts and
21 prayers of our 1.3 million members to the
22 families affected by this disaster, especially

1 the thoughts and prayers of our members who know
2 all too well how you're feeling tonight. And I'm
3 saddened to say this is the third time I've
4 attended a hearing of the Chemical Safety Board,
5 although it is -- I thank you for holding these
6 public hearings.

7 The tragic explosion of the Kleen
8 Energy plant that devastated Middletown and ended
9 lives and livelihoods was not an isolated
10 incident. In fact, it is part of a continuing
11 pattern of horrific natural gas explosions that
12 we at the United Food and Commercial Workers
13 unfortunately know all too well.

14 A year ago this month, on June 9th,
15 2009, members of the UFCW were at work at the
16 ConAgra Foods Plant in Garner, North Carolina,
17 when an explosion tore through their plant
18 killing four workers, injuring more than 70
19 others, and causing the eventual closure of the
20 plant that was the heart of the community. The
21 culprit was natural gas being purged from a pipe
22 as part of the installation of an industrial

1 water heater in the center of the plant.

2 In the aftermath of the explosion, our
3 union worked with our employers to protect our
4 members. The UFCW sought both an explanation of
5 this dangerous procedure, and insurance that the
6 horror of this explosion would never happen
7 again. But what we found shocked us, and
8 compelled us to take action to protect all
9 workers. From Wyoming to Michigan, and Missouri,
10 similar conflagrations caused by natural gas have
11 repeatedly taken lives and destroyed communities.
12 This virtually unregulated world in which natural
13 gas equipment is used in installs is killing
14 America's workers.

15 The members of this Board and their
16 investigators know this. After the Garner
17 explosion, they recommended that the National
18 Fire Protection Association take action to change
19 the safety and building codes to prevent future
20 incidents like this one. The UFCW visited the
21 NFPA's committee hearings, and lobbied its
22 members to make America's working environment

1 safer, but the NFPA co-opted by the natural gas
2 and propane industries refused to act.

3 The word of the explosion here in
4 Connecticut doubled our resolve to fix this lack
5 of oversight and regulation. So, that's why the
6 UFCW is here today, to state unequivocally that
7 voluntary regulatory agencies like the NFPA are a
8 failure. To prevent future disasters like the
9 ones our members have been a part of, there must
10 be a new Occupational Safety and Health
11 Administration regulation or national legislative
12 action to protect our workers, and our
13 communities.

14 We urge this Board to join us in
15 recommending these solutions to our natural gas
16 safety crises rather than those dependent on
17 industry-controlled groups, like the NFPA.

18 CHAIR MOURE-ERASO: Thank you very
19 much, Mr. Yates. The next person that we have on
20 our list is Mr. Mike Morans from the Siemens
21 Corporation.

22 MR. MORANS: Thank you. My name is

1 Mike Morans, and I'm here tonight on behalf of
2 Siemens Energy, Inc., and would like to thank the
3 Chemical Safety Board for its efforts to improve
4 workplace safety, and for the opportunity to add
5 these brief comments to the record of the
6 investigation. I would like to begin by extending
7 condolences to the families of those who were
8 lost, as well as those who were injured in this
9 tragic accident.

10 Siemens shares the Chemical Safety
11 Board's goal to prevent accidents like this from
12 happening in the future, and supports the efforts
13 of the Board to analyze this incident with the
14 ultimate goal of making recommendations that
15 would do just that. Siemens agrees with the
16 Chemical Safety Board's findings that the
17 contractors who clean our plant gas lines can
18 successfully use many other methods besides
19 natural gas, cleaning methods to assure that the
20 fuel supply systems for the gas turbines are
21 clean, and free of contamination.

22 While Siemens does not design,

1 install, or maintain power plant gas pipelines
2 that carry fuel to its gas turbines, Siemens is
3 committed to promoting safe work practices, and,
4 therefore, will make it clear to power plant
5 owners and operators that authorities have warned
6 against the use of fuel gas as a cleaning
7 substance for pipelines. Siemens has never
8 required, nor does not give any recommendations
9 for the use of fuel gas as a cleaning substance.

10 Siemens advocates the development of
11 national codes and standards as the best way to
12 broadly and consistently define, and enforce safe
13 work practices concerning fuel gas pipeline
14 cleaning at power plants, as well as at other
15 industrial and chemical operations.

16 As it relates to the recommendation to
17 expressly state an upper limit to the cleaning
18 force ratio, or cleanliness specification for
19 fuel gas pipe cleaning, Siemens does not believe
20 that this is necessary, since economic,
21 practical, and safety considerations all dictate
22 that the fuel gas pipe cleanliness be achieved by

1 achieving a cleaning force ratio or cleanliness
2 specification that is as close to the turbine
3 manufacturer's minimum as possible.

4 Significantly exceeding the cleaning
5 specification is inefficient, and needlessly
6 expensive.

7 With this clarification, for the
8 record, Siemens concludes by again thanking the
9 Chemical Safety Board for its efforts to use the
10 tools at its disposal to try and avoid another
11 tragedy like the explosion at the Kleen Energy
12 site.

13 Siemens has people working in power
14 plants like Kleen every day of the year, and we
15 have a strong commitment to promoting safety.

16 That's why we support national codes and
17 standards clearly defining the methods,
18 procedures associated with safe cleaning of fuel
19 gas systems.

20 While gas turbine manufacturers can
21 certainly encourage and endorse the use of
22 alternate methods, we don't believe that we are

1 in a position to enforce their use. That is best
2 achieved through national codes and standards.
3 We pledge to support the recommendations of the
4 Chemical Safety Board, and are committed to
5 actively participate with the NFPA, National Fire
6 Protection Association, and the ASME, American
7 Society of Mechanical Engineers, and other
8 interested parties in establishing national codes
9 and standards for fuel gas pipe cleaning to help
10 insure worker safety.

11 Thank you, again, for the opportunity
12 to comment briefly for the record of the
13 investigation.

14 CHAIR MOURE-ERASO: Thank you very
15 much, Mr. Morans. The next person that is on the
16 list here is Mr. Larry Whitmore, who is a
17 resident of Portland, Connecticut. Is he still
18 in the -- okay. Thank you.

19 MR. WHITMORE: Yes, thank you. I just
20 wanted to make some comments about the transition
21 that's going to take place now from the natural
22 gas purging to the non-natural gas purging.

1 I think it's very important right now
2 to, as the Board make recommendations for
3 flaring, minimum height for the pipe, exhaust to
4 make the purging of these ongoing plants safe,
5 okay. The next -- as you transition to a non-
6 flammable gas, I think the person who suggested
7 the sectional cleaning of the pipe as it's being
8 installed to preclude the use of this high-volume
9 gas. There's a lot of different ways to produce
10 high-volume gas that can be used for this
11 cleaning. One is a burst generator commonly used
12 for different industrial purposes, and also a
13 small jet engine type gas generator.

14 So, I just wanted to say that a five-
15 year span for OSHA to come up with regulations is
16 totally unacceptable, and for the future safety
17 of our country, we have to do something
18 immediately. Thank you.

19 CHAIR MOURE-ERASO: Thank you very
20 much, Mr. Whitmore. The next person that we have
21 on the list is Representative James O'Rourke, the
22 Deputy Speaker of the House in Connecticut. Mr.

1 O'Rourke.

2 REP. O'ROURKE: Good evening. I want
3 to thank the Chemical Safety Board. I represent
4 all the people here in Portland, Connecticut,
5 some of my constituents in the neighborhood right
6 near here, whose homes, luckily not their
7 personal safety, no one was hurt there, but they
8 were most closely impacted by the explosion being
9 straight across the river from there.

10 Throughout -- ever since this happened
11 on Super Bowl Sunday, your Board has been the one
12 governmental agency that I've been able to see
13 that's been proactive, informative, and very
14 diligent in communicating with our state
15 government and local officials, and with the
16 public, and even to the point where before this
17 ever happened, you folks have called for an end
18 to gas purging. I was surprised to see that, not
19 having ever heard of an explosion of this type.

20 I think it's a sad commentary that
21 over the last 30 years too many of our
22 governmental agencies, our regulatory agencies

1 have become really toothless captives of what
2 they call stakeholder groups. And that's a
3 euphemism for the lawyers and lobbyists that
4 represent wealthy trade organizations of the
5 industries who have a vested financial interest
6 in preventing regulation and safety precautions,
7 the kinds of which your Board, and labor unions,
8 and other advocates have called for over the
9 years.

10 I was at the hearing this morning. I
11 was appalled, really, to listen to folks talk
12 about how it would take OSHA five years to
13 institute the kinds of regulations and adopt them
14 that you called for even before this explosion
15 happened. How many people need to be killed?
16 How many people -- how much damage to property,
17 how much damage to human life has to happen
18 before these agencies take action?

19 And for that reason, Representative
20 Lesser did an excellent job explaining. I'm a
21 member like him of the Energy and Technology
22 Committee at the legislature. Tomorrow, I'll be

1 writing a letter to the Speaker, and meeting with
2 him, and communicating with also our President
3 pro tem in the State Senate and our Governor to
4 call for, at a minimum, at the earliest
5 convenience a special session to outlaw the
6 practice of gas purging at Connecticut gas plant
7 around the state, and if this happens at any
8 other facilities, as well. There's really no
9 excuse for us to wait any longer. I was glad to
10 hear the letter that you read from the
11 construction company that was building across the
12 river, rebuilding that plant, that they intend to
13 abide by your recommendations in this regard. I
14 expect that they're not doing gas purging any
15 more there. I hope that I'm right.

16 I also would like to see them address
17 the legitimate damage claims from my constituents
18 here in Portland, whose homes were damaged. That
19 seems to not be taking place right now. I know
20 that's probably not under your purview. But,
21 again, I want to thank you for your work, and
22 this meant a lot to us. It's been very helpful

1 to us, and I especially want to acknowledge Mr. -
2 I keep thinking Homestead, but that's not it.

3 CHAIR MOURE-ERASO: Holmstrom.

4 REP. O'ROURKE: Holmstrom. I'm sorry.
5 Mr. Holmstrom. I should remember that, because
6 he has done an outstanding job right from the
7 beginning. He attended our Energy Committee
8 hearings at the State Capitol. He's been right
9 there with the media in the state giving us and
10 the people of the state really some great
11 information, and knowledge, and leading us in the
12 right direction. And I really want to commend
13 him and the staff, and you folks, as well, to
14 keep up the good work and the fight to protect
15 people lives and property. Thank you very much.

16 CHAIR MOURE-ERASO: Thank you very
17 much, Mr. O'Rourke. The next person that we have
18 is Mr. Leslie McFadden. Is he present in the
19 room? I'm sorry, Ms.

20 MS. McFADDEN: Thank you. This is my
21 first time attending a forum like this, so I'm
22 not sure whether any exchange is acceptable, or

1 not. I am an attorney in Middletown, and I
2 represent one of the people who was injured in
3 the blast. And I was just recently retained, so
4 I'm trying to gain all the information I can to
5 represent him well. And it seems that there is
6 at least a wave of people who believe that the
7 gas blowing technique should be displaced by
8 other safer methods. Are the safer methods, or
9 the technology to use the safer methods more
10 expensive than the natural gas blows?

11 MR. WARNER: Excuse me, ma'am. Let me
12 direct -- this is just a comment period. It's
13 not a question and answer period.

14 MS. McFADDEN: Okay. Well, I'm sure
15 I'll dig into that answer. Thank you.

16 CHAIR MOURE-ERASO: Thank you very
17 much. Appreciate your comments. The last person
18 I have here on my list is Mr. Earl Roberts. He
19 is a resident from the Town of Middletown. Mr.
20 Roberts.

21 MR. ROBERTS: Good evening. Thank you
22 very much. Bear with me, I have copious notes,

1 but I believe they're all very relevant.

2 A little bit of background about
3 myself. I attended the meeting this morning, and
4 have garnished some great information. I was an
5 elected official in the City of Middletown when
6 this application became -- as a permit process in
7 2002. I have very good background in it. I
8 served two terms on a Fire Commission, South Fire
9 District, which this plant falls within that
10 jurisdiction, and was a member at the time of the
11 explosion. I'm an intervener in deciding Council
12 applications for this process, and I am also a
13 resident who lives within 1,800 feet when this
14 plant went off. And I can tell you from my left
15 ear with my Navy experience, it was horrendous.
16 And my sympathies go to those people who suffered
17 much more. And I think we all have to be
18 cognizant, and I'm sure you all are tonight and
19 hereafter.

20 Some quick points. In listening to
21 the comments about the gas blows, in the life
22 histories of these plants, are there other

1 opportunities for those gas blows, meaning
2 retrofitting engines and turbines, do they have
3 to revisit that? I think that's an important
4 aspect in anything, because, indeed, regulation -
5 we need to have standards. Being a former Navy
6 veteran, submarines, nuclear power plants, we
7 standardize like France does. We've come to
8 common denominators. I think this industry has to
9 refocus, in part. I'm a capitalist, but I think
10 we need to focus on certain issues to
11 standardize, clearly.

12 The issue of the morning of this
13 blast, I called 911. As being a commissioner, I
14 called the chief on his cell phone. I was
15 concerned quickly, because we had heard on the
16 news that there were deaths. And I asked him
17 about did our fire marshal have any part in this
18 inspection? I was informed quickly that there is
19 no rules that required it. I think that is very
20 unfortunate, very unfortunate, in any capacity
21 such as this.

22 I was notified for several -- for over

1 probably 12 months of blasting on this site. And
2 because of the laws in Connecticut, I was noticed
3 constantly, every day of these blasts. But here
4 you're purging such horrendous volatile chemicals
5 or fuel, and there's no law. It's just a very
6 tragic situation.

7 And the changing of technology with
8 these plants going back to the purging, this
9 particular plant, I recall the application was
10 530 megawatts. I think now, the Siemens
11 individual could allude, it's either 619 or 620.
12 I missed the number, but that's a major change,
13 major. And I think it has to be relevant to site
14 location, the size of piping, all the relevant
15 hardware, and so forth, falls into this purging,
16 I must believe. And when it's not taken by
17 recommendation of Siemens of the number five
18 pounds, I'm not a chemist or an engineer, so I
19 can't -- but in recalling what was said here,
20 that was way out of scope. Whether it's relevant
21 or not, I can't make comment, and I won't, but I
22 think the standardization point still comes to

1 the forefront.

2 And then the last part I want to make
3 a point of is the siting of 125 more plants. I
4 read in the Wall Street Journal recently expert
5 testimony that there's over a trillion cubic feet
6 of gas available in the North America continent.
7 It's not going to go away, so, therefore, your
8 work is going to be much more pertinent, no
9 matter what commission, what President we serve
10 under down the road, these commissions will have
11 to deal with that, and rightfully so. We need
12 fuel. That's why we're here tonight, and that
13 we're here tonight because of that, and we're
14 generating power.

15 So, with that, I personally encourage
16 alternative fuels, nuclear power, or whatever you
17 as individuals, or collectively, can do better on
18 standardization, and cutting that umbilical cord
19 to fossil fuels, I think we'll be better off.
20 Thank you very much.

21 CHAIR MOURE-ERASO: Thank you, Mr.
22 Roberts. I will invite now any other audience

1 members to move to the microphone and say any
2 statement that they have. Please provide your
3 name and your affiliation, if you have any. I
4 will request very dearly, this has been a very
5 long proceeding, that you limit yourself to three
6 minutes, please.

7 MR. TUCKER: Thank you. My name is
8 Walt Tucker. I'm the President of Nutmeg Chapter
9 of American Society of Safety Engineers and a
10 Certified Safety Professional, although I don't
11 speak for the ASSE here today.

12 The question was asked earlier, were
13 there any safety personnel on the job site, and
14 if so, where were they? Well, the answer is,
15 yes, there were, and he died in the explosion.
16 It was my friend, Chris Walters, who's had 20
17 years of experience building power plants as a
18 Safety Director. And he's done this without any
19 guidelines, without any standards to go by. So,
20 consequently, his only resource is his power of
21 persuasion. So, whatever you people can do to
22 get some standards enforced, to give my brothers

1 and sisters in the American Society of Safety
2 Engineers the juice that they need to make their
3 employers do the right thing, so much the better.
4 I think you all have done a wonderful job in your
5 investigation, and I certainly support all of the
6 recommendations that are on the table. Thank you.

7 CHAIR MOURE-ERASO: Thank you very
8 much. We really appreciate your statement. Is
9 there anybody else, please? Please state your
10 name, and limit yourself to three minutes,
11 please.

12 MR. PUSKAR: My name is John Puskar.
13 I'm with a company called Combustion Safety out
14 of Cleveland, Ohio. My condolences to the folks
15 that lost their lives and were injured.

16 A year ago today, I was at the ConAgra
17 Garner site, so I understand the situations well.
18 It's clear to me from what was said, Don, I
19 believe you said that there were people who
20 smelled the odor and left the site on their own.
21 Yet, I believe that probably more than half of
22 the power plants in the U.S., combined cycle

1 plants like this, use natural gas that's not
2 odorized. I wonder if people realize that. I
3 would hope that someone could address the
4 odorization issue. I don't think there's a
5 requirement for it. I think they're exempted
6 from it. I would hope that the State of
7 Connecticut considers that, as well. I think
8 it's a good safety move, in general. Thank you.

9 CHAIR MOURE-ERASO: Thank you very
10 much, appreciate your statement. Are there any
11 other statements from the audience? Please,
12 state your name, and please.

13 MS. BEAMER: Hi, my name is Carolyn
14 Beamer. I'm a member of Local 777. I was there
15 the day of the explosion. I have 29 years in the
16 industry, and the one thing -- the elephant in
17 the room, it seems to me, and on every job is
18 money. It's always money. Whatever corners can
19 be cut to make the job go faster, they will be.
20 And there seems to be another -- what the
21 gentleman just said before about safety. The
22 safety on our jobs, normally the safety inspector

1 or the safety officer is an employer of the
2 contractor, so he doesn't have any teeth. His
3 job is tied to it. He does the best he can. We
4 need these type of regulations to give him some
5 teeth. It's so important.

6 My friends died. They were my dear
7 friends. I was -- by the grace of God, I didn't
8 die. We need regulations. We need standards,
9 because on every job site, if there's a way
10 around a standard or a regulation, it'll be
11 found. If it cuts costs, that's the way it's
12 going to happen. We need regulations. Thank
13 you.

14 CHAIR MOURE-ERASO: Thank you very
15 much, appreciate your statement. Any other
16 persons in the audience that would like to talk
17 in the microphone? Thank you very much.

18 Well, I appreciate your staying this
19 far. It's been a very long meeting, and we are
20 at the verge of finishing here. We would like to
21 ask if anybody from the Board here has any
22 comments. And, if not, we would like to proceed

1 to the vote of the recommendations. So, one
2 comment.

3 MEMBER WRIGHT: Thank you, Mr.
4 Chairman. I wish I shared everybody's belief
5 that an OSHA regulation would prevent this, and
6 that it would take effect immediately. But,
7 unfortunately, it's been my experience that we
8 have over - and I forgot the number now - between
9 20 and 21 open recommendations to OSHA that they
10 haven't fully responded to yet. And that's over
11 the course of my tenure of four years on the
12 Board.

13 That being said, I would just simply
14 like to say that I understand the extingent
15 circumstances that we're facing with respect to
16 doing the Deep Water Horizon investigation, and
17 I'm disappointed that we have decided to forego a
18 formal written report, and to conclude both this
19 case and the ConAgra case at this public hearing.
20 And, I guess, my realization is that the
21 transcript from this hearing will, in fact,
22 represent the report.

1 My preference would be to see a formal
2 written report with analysis of the lessons
3 learned, and I believe that others would have
4 benefit from that. That's not to say that we
5 won't get the word out, because Dr. Horowitz is
6 very good about producing animations that tell a
7 story far better than one could realize by
8 reading a long lengthy report. However, I think
9 our reputation may be tarnished somewhat by not
10 following through with a written report. Again,
11 I understand the extingent circumstances that
12 we're under.

13 With that being said, I would request
14 that the ConAgra transcripts from the meeting
15 that we had there be included in the transcript
16 from this meeting, so that all the issues we
17 discussed there will be finalized in this
18 particular report, if you will.

19 I firmly believe what Carolyn Merit,
20 one of our former Chairpersons had to say, and
21 that is "No worker should have to go to work and
22 not have the expectation of coming home every

1 day." And I firmly believe that. However, I am
2 also leery of being too prescriptive in the
3 language that we make with respect to our
4 recommendations.

5 I would dearly love to see changes, I
6 would dearly love to see standards, but as the
7 staff and my peers are aware, I think we should
8 do our job, and that is identifying the gaps that
9 exist in the coverage, and let the experts
10 develop that. For example, when we recommended
11 to OSHA to develop a combustible dust standard,
12 we didn't tell them to prohibit anything, or to
13 include anything. We said hey, you have a big
14 gap here, and we have a lot of injuries, and a
15 lot of deaths associated with combustible dust.
16 Please make a combustible dust standard to
17 address those hazards. So, I have a
18 philosophical difference on how we make an
19 approach to these recommendations. And I will
20 stand by what I said in ConAgra, and I will stand
21 by that tonight, although, I think there are some
22 excellent recommendations, I think several of

1 them are too prescriptive. Thank you, Mr.
2 Chairman.

3 CHAIR MOURE-ERASO: Thank you. Any
4 other comments from the Board? So, I guess we'll
5 proceed with the Board vote on the Urgent
6 Recommendations as presented here.

7 Yes. The first thing is that I would
8 like to ask that we have a motion from the Board
9 to proceed with the recommendations.

10 MEMBER WARK: Mr. Chairman, I have a
11 motion. Pursuant to the authority under 42 USC
12 Subsection 741-2R6E(i) and (ii), and in the
13 interest of preventing the serious harm that
14 could result if the hazards underlying a natural
15 gas explosion and fire at the Kleen Energy Power
16 Plant are not promptly rectified, I move to
17 approve the Urgent Safety Recommendations to U.S.
18 Occupational Safety and Health Administration,
19 the National Fire Protection Association, the
20 American Gas Association, and the Chair of the
21 NFPA 54 ANSI Z-223.1 Committee, the American
22 Society of Mechanical Engineers, major gas

1 turbine manufacturers, General Electric, Solar,
2 Siemens, Pratt & Whitney, and Mitsubishi heavy
3 industry, and Rolls Royce, the Governor and
4 Legislature of the State of Connecticut, and the
5 Electric Power Research Institute, " as more
6 fully set forth by the staff report on the Kleen
7 Energy Power Plant Urgent Recommendations, which
8 is attached and made a part of this motion.

9 CHAIR MOURE-ERASO: The motion has
10 been read. Is there any second from the members
11 of the Board?

12 MEMBER GRIFFON: I'll second the
13 motion.

14 CHAIR MOURE-ERASO: Mark Griffon,
15 Member of the Board seconds the motion. So, I'll
16 open the floor for discussions of the Members of
17 the Board on the motion. Not hearing any
18 discussion, I think we proceed to the vote.
19 Board Member Bresland.

20 MEMBER BRESLAND: I vote yes.

21 CHAIR MOURE-ERASO: Approve. Board
22 Member Wright.

1 MEMBER WRIGHT: Thank you, Mr.
2 Chairman. For the reasons cited this evening, as
3 well as during the ConAgra public hearing, I vote
4 no.

5 CHAIR MOURE-ERASO: Disapprove. Board
6 Member Wark.

7 MEMBER WARK: I vote yes, Mr.
8 Chairman.

9 CHAIR MOURE-ERASO: Approve. Board
10 Member Griffon.

11 MEMBER GRIFFON: I vote yes in strong
12 support for the motion.

13 CHAIR MOURE-ERASO: And Board Member
14 Moure, that's me. I vote approve. So, the
15 recommendations pass by a vote of 4-1. Thank you
16 very much.

17 (Applause.)

18 CHAIR MOURE-ERASO: As we come to the
19 end of the meeting, I would like to place to
20 everyone here my commitment and the commitment of
21 the whole agency, the Chemical Safety Board, to
22 push for acceptance of these recommendations.

1 The Chemical Safety Board is more than an
2 investigative agency. We must achieve change to
3 insure safety of the workers, protect the public,
4 and help keep the U.S. energy industry operating
5 safely. That benefits every one of us.

6 At this time, and in closing, I would
7 like to reiterate, and to mention again a
8 recognition of our Chemical Board Safety
9 colleagues who conducted what I consider an
10 excellent investigation, specifically, Don
11 Holmstrom, the investigator in charge. He's
12 investigator supervisor of the Denver Office of
13 CSB, and the lead investigator of this particular
14 investigation here. Also, Mr. Dan Tillema, who's
15 an investigator that is sitting, accompanied Mr.
16 Holmstrom, and also Ms. Lauren Wilson, who's
17 another investigator that was part of this team.

18 I would like, also -- excuse me. I
19 would like also to mention that in Denver, and
20 also listening on the phone are two other
21 investigators that cooperated on the production
22 of this investigation, and they are Cheryl

1 McKenzie, who's an investigator, and Mary Beth
2 Mulcahy, that is another investigator. So, let's
3 recognize their work.

4 (Applause.)

5 CHAIR MOURE-ERASO: I also would like
6 to close by thanking, again, Mr. John Bresland
7 sitting here to my side, my predecessor as
8 Chairman and CEO of the Chemical Safety Board for
9 his dedication, his commitment to the mission of
10 the Chemical Safety Board, and his support for
11 the timely completion of this investigation.
12 John, a job very well done. Thank all of you for
13 coming, and to being so patient of going through
14 this very long proceeding, and I declare this
15 meeting adjourned.

16 (Whereupon, the proceedings went off
17 the record at 9:39 p.m.)

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