

**U.S. Chemical Safety and  
Hazard Investigation Board**

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**Hon. William E. Wright**  
Board Member

**Hon. Gary L. Visscher**  
Board Member

**Hon. William B. Wark**  
Board Member



September 4, 2007

Senator Barbara Boxer, Chairman  
Senator James M. Inhofe, Ranking Member  
Senate Committee on Environment and Public Works  
410 Dirksen Senate Office Building  
Washington, DC 20510

Dear Chairman Boxer and Senator Inhofe:

Enclosed are the answers to the questions for the record you sent to the CSB on August 1, 2007, following a July 10 hearing before the Subcommittee on Transportation Safety, Infrastructure Security, and Water Quality. CSB Chairman Carolyn W. Merritt, who testified at the July 10 hearing and to whom the questions were addressed, completed her five-year term and left office on August 2.

Consistent with the instructions from the Committee staff, I am submitting the following responses to the questions in my role as the Board Member Delegated Interim Executive and Administrative Authority. The position of CSB Chairperson is currently vacant, and the nomination of Mr. John S. Bresland to serve as the new chair is currently pending before the Committee.

In preparing these answers, I consulted with the other Board Members, Mr. William B. Wark and Mr. Gary L. Visscher, and we all concur on the attached responses.

If you have any questions or require further clarification on any point, please contact the CSB's Director of Congressional, Public, and Board Affairs, Daniel Horowitz, at (202) 261-7613.

Sincerely,

A handwritten signature in blue ink that reads "William E. Wright". The signature is stylized and cursive.

William E. Wright  
Board Member

Cc: William B. Wark  
Gary L. Visscher  
Carolyn W. Merritt

## Questions for Carolyn W. Merritt

### Questions from: Senator James Inhofe

**1. While all of us would agree that preserving evidence at the site of an incident is important, wouldn't you agree that first responder responsibilities are the top priority and that actions to protect evidence be deferred until those critical responsibilities are fulfilled if the two are in conflict?**

Yes. Emergency response and mitigation activities should take precedence over evidence preservation if the two issues are ever in conflict. Last year, the CSB proposed a rule to govern the preservation of evidence at accidents it investigates. The CSB carefully tailored the proposed rule to ensure that first responders would not be hampered. The preamble to the proposed rule made clear that emergency response and mitigation activities to protect life, health, and the environment take precedence over the preservation of evidence, and that the CSB “coordinates its field investigative activities with other parties in accordance with the National Incident Management System.” The proposal noted that most emergency response activities do not conflict with CSB investigative activity. The proposed rule specifically states that it “shall not be interpreted to abrogate or supersede any other Federal, State, or local agencies’ ability to provide emergency response or to perform their duties arising under law.” As a practical matter, CSB investigative activities at an accident site usually do not begin until fires have been extinguished and the site is safe for investigators’ entry.

**2. I understand that CSB recommended that the United Steelworkers work with API to write a standard on process safety performance indicators. Yet, I also understand that CSB is going to contract with the National Academy of Sciences to work on this same subject. Why are you going to ask the NAS to study industry metrics?**

The CSB report on the BP Texas City explosion and the report of the BP independent review panel headed by former Secretary of State James Baker noted serious process safety problems at BP’s North American refineries. The reports pointed specifically to the lack of attention to indicators for process safety as a key factor in the declining safety performance of BP’s Texas City refinery. Corporate officials focused on the refinery’s falling occupational injury rate and overlooked signs of catastrophic process-related risks at the facility.

The occupational injury and illness (OII) rate is a widely used safety metric in industry and government but is not generally a good measure of the safety of complex technological processes. Consensus about specific process safety indicators has been difficult to achieve because of significant technical and policy issues. Similar indicators are already widely used and reported in the commercial nuclear power sector. An example is the number of unplanned automatic shutdowns at nuclear power facilities, which is a leading safety indicator.

As one option, the CSB is considering a contract with the National Academy of Sciences (NAS) to convene a panel of experts to summarize the state of the art for process safety indicators, identify barriers to the use of indicators, and make recommendations for indicators that can be widely used in the chemical process industries. The panel could incorporate a broad range of scientific expertise and stakeholder perspectives.

The NAS has strong qualifications to lead a consensus process to address this issue. The

academy has expertise in resolving difficult scientific and policy matters and the ability to assemble committees of eminent experts in the required disciplines, ranging from statistics and epidemiology to law and management science. The NAS also has procedures to promote objectivity and balance, insulated from outside interests. Finally, the Academy has a long record of working with federal agencies and Congress on similar issues and a proven track record in the acceptance of its reports and recommendations.

The CSB has also recommended that the American Petroleum Institute (API) and the United Steelworkers (USW) cooperate in developing a American National Standards Institute (ANSI) consensus standard on process safety indicators. At the time of this recommendation, the CSB had only begun to explore the NAS as an avenue for recommending new indicators. We view the NAS process as one feasible way to move the issue forward, and can possibly be helpful to the future development of a voluntary ANSI standard on indicators. The CSB is hopeful that both the USW and the API would participate in an NAS process, if it goes forward.

The CSB does not currently have sufficient resources available to initiate an indicators project through the NAS, which would cost approximately \$500,000. Depending on the outcome of the CSB's 2008 budget request, which includes \$250,000 in funding for safety studies, the agency will make a decision on carrying an NAS project forward.

**Questions from: Senator Frank R. Lautenberg**

**1. How many accidents involving reactive chemicals have occurred since 2002, according to the CSB's records, and how many has the CSB investigated?**

The CSB's screening data include approximately 249 accidents that involved uncontrolled chemical reactions from July 2001 to December 2006.<sup>1</sup> During that period, the CSB investigated 12 reactive accidents, shown in the table below.

Date	Type	Location	Impact
1/16/2002	Toxic release	Georgia Pacific, Pennington, AL	2 killed, 8 injured
4/25/2002	Explosion	Kaltech Industries, New York, NY	36 injured
10/13/2002	Explosion	First Chemical, Pascagoula, MS	3 injured, public shelter
12/11/2002	Toxic release	Environmental Enterprises, Cincinnati, OH	1 seriously injured
1/2/2003	Explosion	Catalyst Systems, Gnadenhutten, OH	1 injured
2/7/2003	Explosion	Technic Inc., Cranston, RI	1 seriously injured, 12 evacuated
9/21/2003	Explosion	Isotec, Miami Township, OH	1 injured, >2000 evacuated
11/17/2003	Toxic release	DPC Enterprises, Glendale, AZ	7200 evacuated
1/11/2004	Explosion	Huntsman Petrochemical, Port Neches, TX	2 injured
4/12/2004	Toxic release	MFG Chemical, Dalton, GA	155 injured, >200 families evacuated
1/31/2006	Explosion	Synthron, Morganton, NC	1 killed, 14 injured
10/5/2006	Fire	EQ Industrial Services, Apex, NC	17,000 asked to evacuate

**2. Please provide details on all known instances since 1997 where CSB investigators have not received full and unfettered access to accident sites due to restrictions by local, state, or other federal authorities.**

We recognize that the aftermath of a major fire or explosion often involves multiple goals and priorities. These goals may include rescuing the injured, extinguishing fires, recovering

<sup>1</sup> CSB screening data are derived from reports provided by other agencies and the news media; in most cases, data have not been independently verified by the CSB.

victims, protecting the environment, controlling imminent safety hazards, ruling out criminal acts, investigating possible regulatory violations, and restoring undamaged parts of a facility to normal production – as well as independently and thoroughly investigating all the causes so that future events can be avoided. Our responses to questions #2-4 attempt to be responsive as best we are able and do not suggest or imply that other parties acted for improper reasons.

The following are instances where the CSB's site access was restricted by local, state, or federal authorities.

Following a major plant explosion on November 22, 2006, that heavily damaged a residential neighborhood in Danvers, Massachusetts, the CSB investigative team was completely blocked from accessing the accident site by state and local authorities. A local site commander publicly declared the Board to be “uninvited,” “unwelcome,” “not a piece of the pie,” and “a distraction that has taken time away from the real investigators.” (See AP Domestic News, November 26, 2006, “Probers Look for Clues in Mass. Blast;” Boston Globe, November 26, 2006, “Dispute besets blast probe US investigators barred from site by Danvers chief;” Salem News, November 27, 2006, “Investigators probe blast cause, feds fight to get access.”)

The blockade remained in place for seven days after the accident, until November 29. During the seven-day period, CSB investigators were refused access to the destroyed facility where the explosion occurred, were denied permission to view damage in the adjacent residential community, and were denied access to view the area from the vantage point of a public waterway. During this period when the CSB was excluded, the central area of the accident site was heavily disturbed and cleared of debris – and possibly important evidence of the accident's cause – using heavy equipment, under the supervision of state and local authorities who controlled the site. Even after the CSB achieved access to the site, and in spite of a written request to state authorities, no photography or documentation of how the site was altered was ever produced.

On April 25, 2002, a reactive chemical explosion in the basement of a mixed-use commercial building in Manhattan injured 36 people, including six New York City firefighters. On the second day of the Board's investigation, the CSB investigative team was expelled from the accident site by New York City fire officers as the CSB sought to interview hospitalized eyewitnesses. By the time the standoff was resolved several days later, the most pertinent physical evidence had been removed from the site by state and local authorities. The CSB never received access to the key evidence nor any control or influence over how it was tested or handled. Later in the investigation, the CSB concluded that weaknesses in the 85-year-old New York City fire code and inadequate code inspections were contributing causes of the accident.

Three years later in June 2005, a massive fire swept through a gas cylinder distribution facility in St. Louis, destroying the facility, triggering the death of an asthmatic woman, and threatening the surrounding community with hazardous metal projectiles. One day into the investigation, the CSB investigative team was removed from the accident site without explanation by St. Louis fire department officials and was denied access to the key physical evidence. The CSB was later able to reconstruct some of what happened based on surveillance video, company documents, and engineering principles, and to recommend improved valve design and cylinder storage practices for companies around the country.

There are additional examples among the approximately 50 investigations the CSB has conducted since 1998. For example, in 1998 local law enforcement officials in Nevada blocked the access of CSB investigators for several days to a mining explosives facility that had been destroyed by a series of accidental blasts. In February 2003, agents from the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) blocked the access of CSB investigators to an industrial explosion site in Kentucky for several hours. In 2004, officials from New Mexico OSHA challenged the CSB's jurisdiction to investigate a fire at an oil refinery near Gallup and blocked access of the team to witnesses for several hours. Local and state officials in North Carolina blocked the CSB's access to the site of a major reactive chemical explosion for approximately 24 hours in February 2006.

**3. Please provide details on all known instances since 1997 where CSB investigators have been delayed in accessing accident sites, witnesses, or information due to company challenges to the CSB's investigative jurisdiction.**

The following are instances where CSB investigators were delayed in accessing accident sites, witnesses, or information due to company challenges:<sup>2</sup>

- In 1999, a Northern California refinery fired key employees involved in a fatal naphtha fire and then imposed settlement agreements that jeopardized the employees' benefits if they cooperated with federal investigators, according to a senior company official. A company attorney later refused to leave a hotel conference room where the CSB had subpoenaed the fired employees; the attorney left only after CSB investigators called in the police.
- In 2001, an Indiana steel mill that experienced a fatal hydrocarbon fire denied CSB investigators permission to enter the site for approximately half a day. Eventually CSB investigators simply entered the site and began their work but by that time the company had cleaned up the physical evidence from the accident.
- In 2001, a Delaware refinery which was the site of a fatal tank explosion placed severe constraints on CSB investigators' movements within the refinery site, confining them to a specific room and requiring them to be escorted at all times. The company later refused access to numerous management witnesses, company witnesses failed to comply with CSB subpoenas, and the company refused for months to produce company emails that could document maintenance practices for the subject tank.
- In 2002, a Mississippi chemical company that had a powerful reactive chemical explosion challenged CSB investigators' authority to enter the premises by claiming that all hazardous substances had been consumed in the ensuing fire and that the CSB had therefore had no jurisdiction under the Clean Air Act. The company later dropped the claim and CSB investigators entered the site.
- In 2003, a North Carolina medical products company delayed CSB investigators' entry to a fatal dust explosion site by requiring extensive and burdensome safety equipment of questionable necessity (Level A or total encapsulation suits).
- In 2003, a Kentucky automotive products company that experienced a fatal dust explosion removed CSB investigators from the accident site and challenged the

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<sup>2</sup> Please see also first paragraph of response to Senator Lautenberg's Question #2.

agency's jurisdiction by questioning whether the massive fire had actually released hazardous air pollutants.

- In the CSB's investigation of the 2005 Texas City refinery explosion, the company disputed whether the CSB was authorized to look at root causes above the level of an individual facility, such as a lack of safety oversight by corporate officials and directors.

**4. Please provide details on all known instances since 1997 where physical evidence at an accident investigation site has potentially been moved, altered, or removed without the CSB's full knowledge and consent.**

Physical evidence is often the key to understanding the sequence of events in a major chemical accident. In some cases, where there are no surviving eyewitnesses, physical evidence is all that remains to tell investigators exactly what happened. Key pieces of evidence – such as valves, explosion debris, or computer records – can be indispensable in understanding an accident and developing recommendations for preventing future accidents. In many cases, knowing the exact positions of control valves at the moment of an accident is critical to understanding what went wrong. In some cases, computer modelers can decipher the nature and fuel for an explosion by performing calculations on damaged or deformed structures – known as “blast markers” – but only if those markers remain intact and undisturbed.

However, if the evidence is moved from its original locations or subject to any possible alteration then the causes of accident may remain permanently in doubt. Worse still, incorrect conclusions may be reached when evidence has been altered without investigators' knowledge.

Disturbance of the physical evidence at accident sites – even after fires have been extinguished and victims have been recovered, and there is no threat of additional environmental damage – has been a common problem that has delayed or impaired many CSB investigations.<sup>3</sup> In several cases, the CSB actually decided not to consider conducting an investigation because, by the time investigators arrived, too much of the relevant physical evidence had been lost or destroyed.

During the first few years of the CSB's existence, the agency had few investigators and did not pursue physical evidence as aggressively. However, from 2001 onward, as the agency became better organized and deployed larger teams more quickly to accident sites, disturbance or loss of physical evidence became a recurrent problem, as shown in the following examples.

- **February 2, 2001:** One worker died and four were injured when flammable liquid was released from a gas piping system at an Indiana steel mill. A key piece of physical evidence – the heating lamp that likely ignited the flammable liquid – was removed from its original location by company personnel before CSB investigators were allowed to access the site.
- **January 16, 2002:** Two workers died and eight others were injured at an Alabama pulp and paper mill when an uncontrolled chemical reaction inside a process sewer released deadly hydrogen sulfide gas onto the plant grounds. By the time CSB

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<sup>3</sup> Please see first paragraph of response to Senator Lautenberg's Question #2.

investigators gained access to the site, the unsealed manhole cover through which the toxic gas escaped had been replaced with a new cover and sealed; the original cover could never be located or examined.

- **April 25, 2002:** Thirty-six people were injured when a reactive chemical explosion in the basement collapsed portions of a Manhattan commercial building. CSB investigators were expelled from the site by New York City fire personnel (see Question #2) and when they were able to return several days later, all the most pertinent physical evidence had been removed, including the containers of waste chemicals that reacted. The CSB never gained access to the evidence and was not allowed to participate in any testing.
- **October 13, 2002:** Three workers were injured and a public shelter-in-place was ordered when a reactive chemical explosion blew apart a 145-foot distillation tower at a Mississippi chemical manufacturer. The CSB requested that the company not conduct testing on a key steam valve that leaked, triggering the runaway chemical reaction and explosion. When CSB investigators left the site, however, the company immediately tested the valve on its own without the CSB's knowledge or input.
- **February 7, 2003:** One chemical plant worker was seriously injured and a public evacuation was ordered when a worker, tapping on a chemical ventilation duct with a hammer, triggered an apparent reactive chemical explosion. The Rhode Island state fire marshal's office removed from the site both the hammer and a large section of the ductwork, including the area where the hammer struck. The CSB could never gain access to this key physical evidence and was never able to determine the immediate cause of the explosion. The CSB uncovered the existence of a company surveillance videotape showing the explosion; when the state fire marshal's office learned of the tape's existence CSB investigators were threatened with arrest unless they surrendered the tape. The fire marshal took the videotape, along with the hammer and the ductwork, but never issued any citations or report on the accident.
- **April 11, 2003:** One worker was killed and a public evacuation was ordered when a vessel overheated and exploded at a Kentucky food additive plant, causing a release of ammonia into a residential neighborhood. When the CSB team arrived at the site, local fire personnel had already loaded physical evidence such as fragments from the subject tank onto a flatbed truck and were in the process of driving the truck away from the site.<sup>4</sup>
- **April 25, 2003:** A runaway chemical reaction and chemical release at a Pennsylvania adhesives producer deposited acrylic polymer on several hundred vehicles, buildings, and members of the public, including nearby middle school students. When CSB investigators arrived the company had already emptied the subject reactor and cleansed it of any residues, which could have pointed to the nature of the reaction. The CSB eventually dropped the investigation.
- **June 22, 2003:** Seven workers were reported to be injured in a plastic dust explosion at a South Carolina pharmaceutical packaging company, including one worker with serious burns. When CSB investigators arrived, the area of the explosion had already been cleaned up by the company. No investigation was done.

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<sup>4</sup> Several days later the fire department brought back the evidence for the CSB investigators to identify.

- **September 21, 2003:** One worker was injured and a public evacuation was ordered when a powerful explosion occurred in a 300-foot tall underground distillation column at an Ohio chemical company. As soon as the fire department released the site back to the company, management instructed employees to clean the site, discarding much of the explosion debris without regard to its possible evidentiary value. The CSB could not determine an exact cause for the explosion.
- **April 23, 2004:** Five workers died and two others were seriously injured when highly flammable vinyl chloride was released from a batch reactor at an Illinois chemical plant, evidently when an operator opened the incorrect valve in a system that lacked many safeguards. Reliable knowledge of the position of the key valve would be critical to any investigation. However, the company determined the accident site to be structurally hazardous and certain hot zones were deemed unsafe for entry. Nonetheless, the CSB learned that on two occasions – prior to any access by CSB investigators – a company supervisor entered the accident site without authorization and gained access to the key valves and other equipment. The supervisor denied altering the evidence but there were no witnesses to corroborate his account.
- **August 26, 2004:** One worker was killed and two others were seriously injured by a reactive chemical explosion at a Dallas-area aircraft parts company. When CSB investigators arrived at the site, the physical evidence of the explosion had already been cleaned up. The CSB decided not to attempt an investigation.
- **December 3, 2004:** After an explosion and fire at a southwest Houston chemical plant, the city building department ordered the immediate demolition of the company's office and warehouse building – even though it had survived the accident and the fire had been extinguished hours earlier. By the time CSB investigators arrived at the site, all the company's documents and equipment records, which were housed in the main office building, had been destroyed, and a large area was cleared preventing search and identification of crucial evidence from the chemical tank that exploded. As the investigation progressed, CSB investigators suspected that the explosion was caused by pressurizing the tank of hot, flammable material with air instead of inert nitrogen. Two company employees then admitted in sworn depositions to CSB investigators that, a few days after the accident, one of the company owners had instructed them to remove and discard the valve and piping that had connected the compressed air system to the nitrogen system. The air-contaminated nitrogen system was determined to be a key factor in the explosion.
- **January 25, 2005:** Three workers were killed in an explosion at an acetylene gas distribution facility in Perth Amboy, New Jersey. Without the CSB's knowledge or consent, federal OSHA inspectors removed the two key pieces of physical evidence from the site: (a) a check valve that was thought to have leaked acetylene gas into a shed near the workers; and (b) a propane space heater that was believed to have ignited the acetylene gas. The evidence was taken out of state, and OSHA conducted its own testing, without CSB input on the testing protocols. The CSB report on the case was largely based on computer blast modeling and engineering analysis of exemplar items purchased by the CSB, rather than actual test data from the key pieces of evidence.

- **March 23, 2005:** During the emergency response to the refinery disaster in Texas City, company personnel changed numerous valve positions in the unit where the explosion occurred, without documenting the original valve positions. The company later tried to assist the CSB in determining the original positions, and the CSB conducted numerous interviews trying to understand what changes had occurred during the response. Nonetheless, certain key valve positions could never be conclusively resolved.
- **June 24, 2005:** After St. Louis fire officials removed CSB investigators from a gas cylinder explosion site (see Question #2), the CSB had no access to the key physical evidence, including a propylene gas bottle that was believed to have leaked through a faulty relief valve. The CSB safety bulletin and recommendations were based on the company report, surveillance video, data provided by the relief valve manufacturer, engineering principles, and a review of other similar fires.
- **November 22, 2006:** During the seven-day period when CSB investigators were blocked from the explosion site in Danvers (see Question #2), state and local fire investigators had unrestricted access and extensively moved explosion debris both by hand and using heavy equipment. This activity occurred long after the fires had been extinguished and any emergency response had ceased. When the site was finally opened to the CSB, a central area within the destroyed chemical facility had been completely cleared of debris – and possibly of relevant physical evidence – using heavy equipment such as a front-end loader (see Figures 1a-c, before and after photographs). CSB investigators could never locate certain key physical evidence, such as steam valves that may have been left open overnight, potentially overheating a tank filled with flammable solvents and causing the explosion. Although a written request was submitted to the state fire marshal’s office, the CSB was never provided with any photographs, video, or other documentation of the handling of the accident site or the movement of the evidence during the seven-day period of exclusion.
- **January 30, 2007:** Four people died at a West Virginia convenience store when gas from a leaking propane tank exploded. During the first several days while the site was under state control, some looting occurred. In addition, private investigators representing individual litigating parties were allowed onto the site. When the site was released to the Chemical Safety Board, CSB investigators controlled the activities of private investigators, secured the key physical evidence under tarps, and enlisted company security guards to protect the site.
- **July 17, 2007:** Approximately 6,000 people were requested to evacuate from a Wichita, Kansas, suburb when fire swept through a solvent distribution company, sending exploding tanks rocketing through the air. Specifically, the fire is believed to have been ignited by a sudden explosion of flammable naphtha in Tank 31. Most of Tank 31 left the ground and landed about 150 feet from the tank farm, on company property. The CSB instructed the company in writing on July 26 to “take special care to preserve” physical evidence in its undisturbed condition, specifically including the “area surrounding Tank 31 and its current location.” Nonetheless, on August 1, the company’s own private insurance firm entered the site – which was then under the company’s control – and, without the CSB’s knowledge or consent, used heavy

equipment to flip over Tank 31 from its as-found position and examine the underside of the tank.

**5. What benefits could the CSB envision in opening one or more field offices outside of Washington, DC?**

The CSB has not taken any formal action to determine the benefits or costs of establishing regional offices, nor has the Board endorsed the concept at this time. However, it is true that for a number of years the CSB has struggled to recruit qualified chemical accident investigators in the Washington, DC, area. Opening one or more field offices in areas where the chemical industry is concentrated could assist with recruiting and retention efforts, since the available talent pool could be larger and the cost-of-living may be lower. Depending on their location, field staff could potentially deploy more quickly to major accident sites, which could promote better evidence preservation and coordination with emergency response agencies. Finally, the existence of at least one field office could allow for some limited continuity of operations in case of an emergency affecting Washington, DC.

**6. What benefits does the CSB see from expanding protections for CSB investigative records from use in civil litigation and in criminal prosecutions? What is the potential impact on the speed and effectiveness of CSB investigations from allowing prosecutors and litigants to use CSB interview records and investigative documents in legal proceedings?**

The CSB expects significant benefits to the investigative process from expanding protections for testimonial records, such as interview or deposition transcripts, from use in criminal and civil litigation. The major benefit would be that witnesses would be more forthcoming in providing critical safety information to the CSB more quickly. Allowing the continued use of such information in civil and criminal litigation will have a chilling impact on witnesses who may wish to speak to the CSB. This would damage the speed and quality of CSB investigations. On the other hand, modifying the CSB statute to protect witness information would not prevent other authorities from independently collecting their own witness statements for use in civil or criminal proceedings, which they almost always do anyway.

Clearly Congress never intended the Chemical Safety Board to be an arm of federal criminal prosecution agencies. However, in the case of a CSB investigation into a fatal accident in Texas in 2003, federal criminal investigators demanded access to and custody of witness statements that had been provided voluntarily to CSB safety investigators – backed by a threat to subpoena the CSB chairman and other officials before a federal grand jury. In 2005, a state district attorney in Kentucky sought a variety of CSB records for use in a state criminal investigation, including an all-encompassing request for any incriminating statements made to CSB investigators conducting an investigation of a fatal tank explosion in Louisville in 2003.

In a more recent case, state officials in Massachusetts have repeatedly requested CSB information for potential use in regulatory or criminal citations. As a result of more scrutiny of chemical accidents by a variety of federal and state authorities, the CSB is beginning to encounter greater reluctance from witnesses and companies who face potential criminal prosecution for accidents that the CSB investigates. For example, during an investigation into an accident at a Delaware oil refinery in 2001 and 2002, a number of witnesses retained criminal defense counsel and CSB depositions were delayed for months. The NTSB has

encountered similar problems with witnesses who have asserted the Fifth Amendment privilege against self-incrimination and refused to cooperate with safety investigations.

By contrast, the U.S. Air Force provides that information supplied to its safety investigators “may not be used in any disciplinary or criminal proceedings”. See James K. Brengle et al., *Aviation Professionals and the Threat of Criminal Liability—How Do We Maximize Aviation Safety?*, 67 J. Air L. & Com. 875, 902 (Summer 2002). This has prompted some to call for greater protection of information provided to NTSB safety investigators. See *id.* at 928 (recommending in part that legislation should be adopted prohibiting the use of any information provided to the NTSB in an accident investigation against the provider of that information in a subsequent criminal case, except in a prosecution for perjury or giving a false statement). The same arguments for protecting such information should also apply to CSB safety investigations.

It is also increasingly common for attorneys in civil litigation arising from accidents investigated by the CSB to make Freedom of Information Act (FOIA) requests for the transcripts of witness interviews and other investigative records. The transcripts are then used for a variety of litigation purposes for which they were never intended. Companies subject to CSB investigations, knowing that their employees’ statements and testimony may be used against the company in litigation, are more often insisting that company attorneys be permitted to observe investigative interviews. Such observation is strongly disfavored in safety investigations, because it may discourage witnesses from being forthcoming with critical information about problems and deficiencies that might reflect poorly on their employers.

An additional concern is the potential negative impact on the witnesses resulting from the availability of interview transcripts to litigants. For example, witnesses may receive unwanted contact from attorneys seeking or even compelling their participation or testimony in the litigation. If the contents of the witnesses’ statements are further disseminated, the witnesses may be subjected to criticism or retaliation from co-workers or employers. Current exemptions to the FOIA do not allow the CSB to adequately protect interview transcripts from disclosure.

Other federal agencies have exemption provisions in their enabling statutes that provide greater protection of witness information. See 15 U.S.C. § 1314(g) (Antitrust Civil Process Act), 15 U.S.C. § 57b-2(f)(1) (Federal Trade Commission investigations), and 31 U.S.C. § 3733(k) (false claims investigations). The United States Air Force has adopted a safety program in which Safety Investigation Board (SIB) investigators may grant witnesses a promise of confidentiality. See generally Air Force Instruction 91-204, Privileged Safety Information, 14 February 2006. Relying on the “military safety privilege,” the Air Force has consistently withheld from the public certain safety information contained in its accident investigation reports. See *United States v. Weber Aircraft Corp.*, 465 U.S. 792 (1984) (holding that Exemption 5 of the FOIA incorporates the special privilege protecting witness statements generated during Air Force aircraft accident investigations).

## **7. What kind of response has the CSB received from its outreach program, specifically its production and distribution of safety videos?**

In late 2005, we began complementing our lengthy written reports with short, computer-animated safety videos. People can view or download these videos over the Internet or receive a free DVD copy by filling out a web-based request form.

The response to this new program has been remarkable. For each person who accesses one of the CSB's written reports, roughly a hundred people watch the videos and use them for improved training, engineering, and process design. Since the program was launched in December 2005, the safety videos have been viewed almost a million times over the Internet, and we have distributed tens of thousands of DVD copies to large and small companies, labor unions, and trade organizations.

We have received DVD requests from 40 companies on the 2007 Fortune 100 list – including food, automotive, insurance, and electronics giants as well as all the nation's largest oil and chemical companies. We have received video requests from 47 of the top 50 U.S. chemical companies as ranked by *Chemical and Engineering News*, including all but one of the 17 chemical companies listed on the Fortune 500.

Many hundreds of people have written to the agency explaining how much they value this service by the agency. For example, a representative from a south Texas site of one of the world's largest oil companies wrote:

*To demonstrate the importance of the videos produced by the CSB, [we have] made it mandatory for all 1000 of the people at our facility to watch and discuss the videos in a plant wide "time-out for safety" meeting. We are bringing in the shifts early just to watch this film ... I cannot begin to thank your organization enough for the work that you do. Your videos are a huge success with our employees in driving safety forward.*

A safety manager at a major polymer company in Ohio stated:

*The CSB animations are exceptional learning, re-learning, and awareness tools for chemical plant safety topics ... we have forwarded the CSB [videos] to our 500+ employees & contractors including operators, maintenance personnel and many staff people .... Taxpayer money was never better spent! Thanks and keep them coming!*

A small specialty chemical company in Connecticut wrote:

*I believe your animations & videos are phenomenal. As a small company it is cost prohibitive to purchase multiple videos for training which identifies consequences like the animations you provide. I believe personally and as a safety professional in the chemical industry that the videos you provide are invaluable.*

Finally, a California power company noted:

*We just recently viewed the Sterigenics video and watched the reaction of the employees. Your presentation was so clear and well presented that everyone was in complete awe after seeing it. The safety message appeared to sink in much better than any other type of presentation that we have seen.*

Each of these videos that we produce, at a budgeted cost of \$35,000 each, represents an investment that can potentially prevent multiple tragic and costly accidents at workplaces around the country. However, until this year the Board has neither sought nor received any additional funding for this unique program; we have funded the development of 10 safety videos almost exclusively using small unspent balances from elsewhere in the agency.

**8. What kind of financial and programmatic audits does the CSB believe are appropriate for an agency its size?**

With only about 40 personnel, the CSB is among the smallest of the federal micro-agencies. Under the system established by Inspector General Act, the CSB would be considered a “federal entity” as distinct from the cabinet departments and larger independent agencies.

Federal entities are micro-agencies that, with the exception of the CSB, do not have Inspectors General. Instead, federal entities are required to take actions to ensure that audits are conducted of programs and operations in accordance with the standards issued by the Comptroller General of the United States. Federal entities are also required to report annually to each house of the Congress and the Office of Management and Budget (OMB) on audit and investigative activities in their organizations.

The CSB and similar agencies are specifically required by existing law to conduct financial and information security audits. In addition, micro-agencies are required to file well over 50 reports or evaluations annually to a variety of federal agencies and Congress on a wide range of topics. Finally, a number of federal agencies, including the Government Accountability Office (GAO), the Office of Personnel Management (OPM), the Office of Government Ethics (OGE), and the Equal Employment Opportunity Commission (EEOC) are authorized to conduct their own program evaluations of our agency and others like it.

Since 2000, a series of unique appropriations riders have established an inspector general for the CSB, a role currently filled by the EPA inspector general. It is essentially unprecedented for an agency our size to be under continuous audit by a 300-person inspector general office from a cabinet-level department. While Congress had reasons for creating this arrangement back in 2000 – when the CSB was confronting the difficulties of starting up – it has long outlived any usefulness and should be discontinued. In addition, the selection of the EPA inspector general to oversee the Board poses a particular conflict of interest, since Congress established the CSB to be fully independent of the EPA and, indeed, to make recommendations about EPA safety programs.

**9. What environmental regulatory issues, if any, are raised by the CSB’s investigation of BP Texas City and does the CSB plan any follow-up activities based on these findings?**

The CSB’s report determined that the March 2005 explosion occurred when flammable liquid was discharged through relief valves into an antiquated and unsafe blowdown drum and stack that vented directly to the atmosphere. Our investigation found that the same isomerization (ISOM) unit blowdown drum had caused eight other previous serious incidents – including two incidents where the blowdown stack caught fire and six large releases of flammable vapor that could have ignited with catastrophic consequences. BP’s own safety standards required the replacement of the unsafe blowdown system but managers had not done so despite several opportunities.

Many of these blowdown drum incidents were also reported as environmental releases. In 2002, BP self-reported environmental violations to Texas environmental regulators and instituted a new compliance initiative, known as “Clean Streams.” The goal of Clean Streams was to reduce releases of benzene, volatile organic compounds, and hydrogen sulfide from blowdown systems. In 2002-2003, the Clean Streams project group studied eliminating the ISOM blowdown drum and rerouting the discharges to a flare system, which would have been safer and less polluting.

However, BP managers did not choose that option because the ISOM unit did not have an up-to-date relief valve study, even though the study was required under longstanding OSHA process safety regulations. Instead, some of the benzene waste streams were diverted to a closed system, but the emergency relief valves continued to be routed to the blowdown drum. This took advantage of an exemption in the environmental regulations for “upset emissions” – unplanned releases that can occur during process startup, shutdown, or upset.

If the relief valve discharges had been routed to a flare system, the fatal consequences of the March 2005 incident could have been averted. The release of hazardous chemicals from upset emissions is both a process safety and an environmental issue. The CSB may consider a study of the issue of these upset releases to determine the seriousness of the problem; the impact on workers and public health and safety; and what improvements are needed to industry practices, control technologies, or regulatory requirements and enforcement to prevent upset emissions.

#### **10. How do OSHA and EPA’s process safety inspection programs compare with other countries or jurisdictions within the U.S.?**

The CSB has not conducted a comprehensive study comparing U.S. process safety regulatory programs with those of other nations, nor has CSB studied the effectiveness of different inspection programs or compared overall process safety in the U.S. with other countries.

However, the CSB’s investigation of the BP disaster found that OSHA conducted relatively few planned, comprehensive process safety inspections – known as Program Quality Verification (PQV) audits – of oil refineries and chemical plants that are covered under the Process Safety Management (PSM) standard. In the ten years from 1995 to 2005, federal OSHA only conducted nine such inspections anywhere in the country, and none in the refining sector. States that operate their own OSHA-approved workplace safety programs (state-plan states) conducted only a modest number of PQV inspections during the same period: 48 planned inspections over ten years, including six at refineries. Federal OSHA did conduct unplanned inspections of the Texas City Refinery in response to accidents, complaints, or referrals. But these unplanned inspections are typically narrower in scope and shorter than planned inspections.

An important reason for the number of planned inspections of refineries and chemical plants during that time period may have been that OSHA’s enforcement program was focused on industries and workplaces with relatively high injury rates. In the past couple of years OSHA has initiated two programs which may help to address this. One is the Enhanced Enforcement Program, under which repeated workplace fatalities, such as had occurred at the Texas City Refinery prior to the 2005 explosion, would bring broader enforcement scrutiny. In addition, OSHA has undertaken a National Emphasis Program for refineries, under which all refineries located in federal jurisdiction states will receive a “PSM focused” inspection over the next two years.

The EPA enforces a similar regulatory program designed to prevent catastrophic releases under the Risk Management Program rule. This rule requires covered facilities to submit emergency contact information, descriptions of processes and hazardous chemicals onsite, accident history, and worst-case release scenarios. The EPA enforcement of the Risk Management Program rule has focused primarily on the review of the required submittal document, known as the RMP, and required updates by the covered facilities.

In 1999, EPA established an audit program to help ensure compliance with the Risk Management Program. The audits were intended to provide an independent verification of the information in RMP submissions and include on-site inspections. EPA records show that the BP Texas City facility had not received a planned Risk Management Program rule audit prior to the March 2005 explosion, however. The CSB requested documents from the EPA about Risk Management Program enforcement and only received a partial response: the EPA's response did not provide requested items such as the total number of Risk Management Program audits conducted, the audit selection process description, audit reports, and the number of Risk Management Program inspectors.

By contrast, California's Contra Costa County has its own Industrial Safety Ordinance, which requires regular inspections of covered facilities with catastrophic chemical hazards. The county inspects its 48 covered facilities every three years. Each year a staff of five engineers performs an average of 16 inspections. Similarly, in the United Kingdom the Control of Major Accident Hazards regulation (COMAH) requires facility operators to submit a safety report detailing their plans to prevent major accidents. Annually, 105 government inspectors (typically engineers and scientists) visit high-hazard facilities, and all COMAH-covered facilities are inspected every five years. Each of the nine oil refineries in the U.K. received a detailed, planned inspection every year. These comprehensive inspections, which range in duration from 80 to 150 days, are conducted by a multidisciplinary team of government regulatory inspectors and specialists in process safety, mechanical engineering, electrical engineering, and instrumentation.

**11. How many investigation teams would the CSB need to investigate all of the approximately 20 priority accidents that occur each year in the U.S., according to your testimony? What would be the annual cost of maintaining those teams?**

The CSB currently has three investigative teams that deploy to approximately eight accident sites a year. According to the agency's existing human capital plan, each team is to consist of one GS-14/15 investigator-in-charge and 4-5 other investigators with various skills. To conduct 20 investigations a year, the CSB would need to add four additional teams of five investigators each, a total of at least 20 new investigative positions. The total cost of the additional investigative capacity – including salaries, benefits, and program expenses – would be approximately \$5 million per year.

In addition, the agency would need to increase other functions such as legal support, public affairs, procurement, human resources, and information technology. We would also have to rent additional office space. We project that achieving the overall growth to conduct 20 investigations a year would require an annual budget of approximately \$20 million. This figure is similar – after adjusting for inflation – to the \$12 million authorized in proposed 1989 Senate legislation establishing the Board.

**12. Please describe any delays that have occurred during CSB investigations as the result of disputes with other parties over evidence testing protocols.**

Disputes over evidence are a common source of significant delays in CSB accident investigations. These disputes can directly impair the CSB's mission, by preventing the agency from rapidly determining causes and disseminating information that other businesses can use to avoid similar accidents. Some evidence is fragile and data may be lost due to delays. The CSB's existing statute is silent on the subject of evidence testing, whereas the NTSB's authorizing statute gives it exclusive authority to determine who will conduct

testing, what tests will be performed, and who will be allowed to witness the testing (see 49 U.S.C. §1134). The CSB's experiences in seeking to conduct critical evidence testing have been much different than those of the NTSB.

For example, on January 30, 2007, four people were killed and five others were seriously injured when propane leaking from a storage tank exploded at a convenience store in Ghent, West Virginia. A CSB investigation is underway, but seven months after the accident, CSB investigators have still not been able to conduct full testing of the key piece of physical evidence, a withdrawal valve on the propane tank. The agency has been delayed for months by negotiations about testing conditions among some 41 different litigating parties, including representatives of companies, insurers, and victims. Litigating attorneys have gone to local courts and the news media and even threatened to seek a federal court injunction in an effort to delay testing and have it conducted on terms more favorable to their clients' various improbable theories.

In another accident investigated by the CSB, six workers were seriously injured in a hydrocarbon explosion at a refinery in Gallup, New Mexico, on April 8, 2004. Within a few days, CSB investigators were focused on a critical isolation valve that suddenly and unexpectedly released the flammable hydrocarbon onto the plant grounds. The valve was removed from the equipment and secured at the refinery site, but for months the company refused to release the valve to the CSB for testing to understand why the accident happened. Finally in October 2004, the CSB served the company with a subpoena for the valve, but the company resisted the subpoena. On the eve of a federal court hearing to enforce the subpoena, the company relented but did succeed in delaying the actual testing until February 15, 2005 – more than ten months after the accident. Safety issues need to be highlighted to others who potentially face the same danger in a timely manner in order to prevent additional loss of life or injury. Delays in reporting can cost additional lives.

In another case, an attorney representing community members near a 2004 chemical plant explosion site in Houston delayed for months the CSB's effort to remove and test critical equipment. After repeatedly delaying one test program, she failed to show up at the test lab on the agreed-upon day to witness the test. It proceeded without her.

In a fourth example, the CSB has been significantly delayed in testing the critical control station, valves, and piping that failed on February 16, 2007, at a refinery in Sunray, Texas, causing a major fire that injured three workers, shut the refinery for several months, and had a major impact on gasoline prices in the Midwestern U.S. The company, which is the largest U.S. refinery operator, proposed testing the evidence at a firm with which it had a significant business relationship and also to limit the information the testing laboratory could report to all parties, including the CSB. The company opposed testing at the National Institute of Standards and Technology, which the CSB had proposed. The company retained custody of the subject equipment, and negotiations delayed the testing for months until the CSB finally took possession of the evidence in late July 2007.

**13. If the CSB received legislation similar to the NTSB granting it primary authority for evidence preservation and testing, how would the CSB plan to share evidence and test results with other parties?**

For physical evidence, the CSB would seek to ensure the preservation of key items that are critical to our investigations. The CSB efforts to preserve evidence benefit all parties in an investigation. To the extent the preserved physical evidence is unique and is also important

to other interested parties, the CSB would provide access as needed for inspection, as it does now.

The CSB would develop appropriate testing protocols with input from other parties and then would share the factual results of testing with other parties as soon as the results became available. The CSB would also seek to release physical evidence back to the owners as soon as feasible. Once the CSB has finished with its own inspection and testing, other parties could use the physical evidence as needed for civil or criminal litigation.

Non-unique physical evidence – such as liquid samples from a large available volume in a tank – can typically be distributed to any and all interested parties and processed independently by each party.

#### **14. How do the CSB’s root-cause accident investigations differ from those conducted of the same accidents by state and local authorities?**

In the course of our root-cause investigations, we generally collect all available state and local reports on the accident, including reports of police and fire departments and fire marshals. Police and fire personnel frequently have responsibilities for emergency response, identification and prosecution of crimes, and code enforcement but generally lack expertise in chemical plant operations, process safety, or accident prevention.

State and local reports differ greatly from the nationally distributed accident reports that the CSB produces. First, most local and state reports are not available online and may not be publicly disclosed at all, and few, if any efforts are made to distribute them to other businesses or organizations to promote accident prevention. The reports are generally descriptive in nature and typically contain little or no analysis of the overall significance of an event.

Police and fire reports are often simply compilations of written or typed notes from various responding officers, describing what they saw and where they went, what witnesses told them, the nature of damages or injuries, and the timing of events. In some cases, fire marshals will complete a somewhat more detailed report on the cause and origin of a fire, identifying the fuel, ignition source, and circumstances of the fire. Often the purpose of a fire marshal’s report is to determine if arson was involved, which is, in fact, almost never the cause of a major industrial fire or explosion.

Local and state reports rarely if ever contain new safety recommendations, and certainly not recommendations like those of the CSB that are often national in scope and may propose changes to laws, regulations, codes, standards, or emergency response procedures.

For example, when an explosion killed two workers and seriously injured a third at a Florida wastewater treatment plant in 2006, the CSB conducted a detailed, year-long analysis of training procedures; hazard communication; deficiencies in equipment design, construction, and maintenance; OSHA standards and national fire codes; and Florida state and local regulatory programs. The CSB convened a public hearing to gather stakeholders’ views and then ultimately recommended that Florida provide OSHA workplace protections for all its state and local government employees – protections they currently lack. The CSB then prepared a safety video on the accident for national distribution, conducted extensive outreach to the Florida state legislature, and submitted testimony to Congress on the need to improve workplace safety coverage for public employees throughout the country, using the Florida explosion as an example.

By contrast, the Florida State Fire Marshal's office examined the same explosion and prepared a relatively short narrative report, written in the first person. The report described the basic circumstances of the event and identified the fuel and ignition source. The report noted the safety training given to the workers who were killed and injured but did not comment on its adequacy. The report did not look at the adequacy of the engineering design of the plant equipment or note the lack of OSHA coverage for city employees. The report concluded: "All evidence and witness testimony support the conclusion that this explosion and fire was accidental in nature .... No further follow up in this matter is required."

Similarly, there are stark differences between the CSB's report on a 2005 gas cylinder fire in St. Louis and the report prepared by city fire officials. Although the CSB was significantly hindered in its investigation due to a lack of access to the site and the physical evidence (see Questions #2 and #4), the Board nonetheless issued a national safety bulletin and safety video designed to prevent similar accidents that endanger the lives of the public.

The CSB report identified a flawed cylinder relief valve design as the immediate cause of the accident but then pointed to inadequate national industry standards for those valves. The Board recommended that the national trade organization, the Compressed Gas Association (CGA), revise those standards to reduce the likelihood of accidental releases from propylene cylinders during hot weather. The CGA is already acting to implement the recommendation.

The Board also urged all businesses that distribute flammable gas cylinders – of which there are likely hundreds located in urban areas around the country – to use specific measures to prevent the rapid spread of fire from cylinder to cylinder, including gas detectors for early warning, water deluge systems, and physical barriers. The CSB safety video showed dramatic footage of other similar cylinder fires that occurred around the country, identified during the CSB investigation, and underscored the potentially deadly hazards from rocketing gas cylinders.

Examining the same accident, the six-page final report by the St. Louis Fire Department, which had removed CSB investigators from the accident site, correctly concluded that the cause of the fire was "the ignition of fugitive propane or propylene gases ... within the area of origin" and identified "relief valve venting ... due to a failure in the relief valve" as one of six possible sources of the gas. However, the report contained no recommendations or observations at all about how such a fire could be prevented or mitigated, nor did it identify the similar major fires that occurred from 1997 to 2005 in Arizona, Oklahoma, and California, all on hot weather days. The fire department report did not examine the standards or performance characteristics of propylene cylinder relief valves, a key element in the CSB findings. The St. Louis report is not publicly available over the internet and was only obtained by the CSB in facsimile form through a specific document request.

**Figure 1a.** Aerial photograph of Danvers, Massachusetts, explosion site taken on Friday, November 24, 2006, two days after the explosion. The photograph was taken after the emergency had ceased but before the removal of debris/evidence by state and local fire services. Yellow-enclosed area includes key evidence zones that were disturbed over the next several days before the CSB was given access to the site on November 29.



**Figure 1b.** Aerial photograph of Danvers, Massachusetts, explosion site taken on December 6, 2006, showing the area (outlined in yellow) that was disturbed and cleared of debris/evidence by Massachusetts fire services between November 24 and November 29, 2006.



**Figure 1c.** Close-in photograph taken from a manlift basket on December 15, 2006, showing the extent of the evidence disturbance that occurred between November 24 and 29 (area that was cleared of debris/evidence using heavy equipment is outlined in yellow).

