U.S. Chemical Safety and Hazard Investigation Board

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May 17, 2013

The Honorable Barbara Boxer
Chairman
U.S. Senate Committee on Environment and Public Works
410 Dirksen Senate Office Building
Washington, DC 20510

Dear Chairman Boxer:

Thank you for the opportunity to share information on the U.S. Chemical Safety Board's (CSB's) ongoing investigation into the tragic explosion and fire on April 17, 2013, at the West Fertilizer Company in West, Texas. I would also like to thank you for your ongoing support and interest in the CSB's investigations and mission.

The CSB deployed a team of 18 investigators and other technical experts within 24 hours of the incident and has maintained a continuous presence in West. The sudden blast at West Fertilizer led to at least 14 fatalities, approximately 200 injuries, and widespread damage and destruction to the surrounding community. The damage to homes and apartments – as well as vulnerable facilities like schools and a nursing home – is the worst the CSB has ever seen from any chemical incident since we were established in 1998.

To summarize what is currently known about the incident: the disaster occurred at the West Fertilizer site after normal business hours, at about 8 p.m. on April 17. The facility was a small retail distribution center that served farmers in the surrounding community and had approximately 15 employees. No manufacturing occurred at the site, only blending of fertilizers for retail customers. Fertilizers such as ammonium nitrate and anhydrous ammonia were delivered to the site by rail car or truck. The ammonium nitrate, a granular solid, was stored in the facility's fertilizer warehouse building in bins. Both the warehouse building and the bins were of combustible wooden construction, and the building also contained significant quantities of combustible materials such as seeds stored near the ammonium nitrate. Not only did the building lack fire protection systems such as automatic sprinklers, but current U.S. fire codes do not clearly require sprinklers in such buildings, leaving such decisions to the discretion of local authorities. Since the state of Texas and many Texas counties (including McLennan County where the West

facility was located) have not adopted any mandatory fire code, it is not clear that sprinklers could have been required at West Fertilizer.

The incident began with a small fire that spread to involve the combustible materials surrounding the ammonium nitrate. Through an as-yet undetermined mechanism, this caused the ammonium nitrate to detonate with the force of multiple tons of TNT. First responders who were nearby were killed or severely injured, and the resulting shockwave damaged or destroyed buildings in a large area of West, including three public schools, an apartment block, and a nursing home.

We have received valuable cooperation in the investigation from West Fertilizer company personnel as well as the mayor and other civic leaders in West. We have also had exchanges of information with the fertilizer industry, including The Fertilizer Institute, which represents manufacturers and distributors of ammonium nitrate as well as many other fertilizer materials. We believe the industry is committed to learning from this incident and making any appropriate safety improvements.

The CSB is dedicated to providing a thorough public account of all the factors that led to this catastrophe. After a disaster of this scale, it is essential to pursue improved safety as we look toward the future. Here are our answers to the specific questions you asked in your April 30 letter.

Question 1: Please describe the CSB's plans to investigate the explosion at the West facility, including the scope and timelines of the investigation.

The CSB will be examining many issues surrounding the explosion such as the safe storage and handling of ammonium nitrate, the siting of hazardous chemical facilities in proximity to vulnerable buildings and residences, and emergency responder safety. The investigation will examine the adequacy of national standards, industry practices, and regulations for the safe storage and handling of ammonium nitrate.

The CSB's timeline for completion of the investigation is 12 – 18 months but we will seek to release preliminary findings, and possibly interim or urgent safety recommendations, as appropriate prior to the release of a final report. The investigation is occurring at time of many challenges for the agency, including a longstanding backlog of open investigations (related to a limited number of investigators on staff) and the impact of the current budget sequestration, which greatly constrains new hiring.

The CSB's investigative team has identified a number of key areas of inquiry that we will pursue over the course of our investigation:

1. **Analysis of the adequacy of existing standards for the safe handling and storage of ammonium nitrate (AN)**. Two prominent U.S. code organizations (the National Fire Protection Association and the International Code Council) have developed fire safety codes for AN. The CSB will examine the adequacy of these codes (such as NFPA 400) in light of the findings about this incident. The current codes discourage

the storage of combustibles near AN but have not incorporated recommendations from overseas regulators for measures such as dedicated, noncombustible storage buildings for AN.

2. **Application of fire codes to the West facility.** As the CSB pointed out in a 2003 investigation of a major petroleum blending facility fire south of Houston, Texas has no statewide fire code and has adopted unusual provisions prohibiting many rural counties from adopting any fire code. As a result, the West facility was not legally required to follow either NFPA or ICC consensus fire codes related to ammonium nitrate storage.

3. **Hazardous facility siting, zoning and land use planning**. The West Fertilizer site had existed since at least the early 1960's before the northern section of West was extensively developed. Over the ensuing years, numerous residences, a nursing home, a health care facility, several schools, athletic fields, and other facilities were constructed nearby the fertilizer site. The explosion destroyed buildings hundreds of feet away and caused significant damage to buildings as much as half a mile distant. Several fatalities occurred offsite in public or residential facilities. The CSB will examine how land use planning around hazardous facilities can be improved to better protect the public. The CSB will also conduct vulnerability assessments to seek to understand the potential "worst case" from an ammonium nitrate explosion near structures like schools. In West, the town's Intermediate School was located only a few hundred feet from the site and was virtually destroyed; had children been present at the time of the explosion, the effects could have extremely severe. The fact there are several thousand retail fertilizer facilities across the country underscores the importance of these assessments.

4. **Ammonium nitrate detonation mechanisms**. Catastrophic ammonium nitrate explosions have occurred periodically around the world over the past hundred years. Scientific literature suggests that pure ammonium nitrate is difficult to detonate but can be sensitized by heating, shock, contamination, and/or confinement. The CSB will examine which of these factors may have contributed to the West explosion and how other facilities that store AN fertilizer should minimize the risk of an explosion.

5. **Inherently safer alternatives**. The CSB has already began a dialogue with the fertilizer industry and others to better understand the usage of AN fertilizer, which currently represents only about 2% of applied nitrogen fertilizer in the U.S. The CSB will examine whether other AN or nitrogen formulations could achieve the same benefit for farmers with a significantly reduced risk of explosion for storage sites.

6. **EPA Risk Management Program (RMP)**. Following the Bhopal disaster in India in 1984, Congress mandated in 1990 that EPA adopt a regulatory Risk Management Program (RMP) to prevent acute chemical catastrophes that would threaten the public. EPA's final rule in 1996 imposed safety requirements for certain toxic and flammable substances but did not include reactive or explosive materials like AN. In 2002, the CSB recommended that EPA broaden the coverage under the RMP program

to include hazardous reactive chemicals, of which AN is an example.[1] EPA has not acted on the recommendation to broaden coverage, and as EPA Inspector General reports have noted the agency has also had difficulty providing resources and adequate inspections to enforce even the existing programs at thousands of hazardous facilities across the country. This issue should be revisited in light of the community devastation from the West explosion, as well as the ongoing occurrence of a significant number of other reactive incidents nationally.

8. **Emergency preparedness for chemical disasters.** Numerous CSB investigations around the country have highlighted community challenges in preparing for and responding to major chemical incidents. In 1986, Congress established a system to improve preparedness through state and local emergency planning committees, which were required to be set up across the country. However, this system has no federal funding mechanism and often relies on the services of volunteers and local committees that lack much real authority. The CSB will examine the efforts of West Fertilizer and community authorities to exchange information about the site's hazards.
9. **Firefighter training and hazard awareness.** The extensive and tragic loss of life in West – the incident killed twelve responders along with two members of the public who were assisting the response – makes it important to look for opportunities to improve training materials and guidance for fighting fires that may involve AN. The CSB will review fire codes, DOT guidance for firefighters, and others materials that may guide responses to future AN fires.

Questions 2: Please provide a list and description of all recommendations you have made in the past relating to reducing risks at facilities that handle highly explosive and toxic materials and whether they have been adopted by government or industry
Question 3: Please identify the recipients of these recommendations

The CSB identified a number of prior investigations that related to highly explosive or toxic materials, dating back to the CSB's establishment in 1998. Most CSB reports include multiple recommendations designed to promote improved safety in the future. The attached table summarizes the recommendations from these reports, including the text, date of issue, and current status or date of closure. Across all of its investigations, the CSB has now achieved a favorable closure rate of approximately 72%, and this figure continues to increase. However, the CSB recognizes that certain key recommendations over the years – including the above-mentioned recommendations for strengthening the EPA Risk Management Program – continue to need further action.

Additional Relevant Issues and Challenges for the CSB's West Investigation

The CSB considers the West explosion to be among the most serious U.S. chemical incidents affecting the public in many decades. We believe that an independent root-

[1] The West Fertilizer facility was covered under the RMP program for its anhydrous ammonia but not for its ammonium nitrate. The ammonia was not directly involved in the explosion.

cause investigation is therefore of the utmost priority. In addition the CSB is statutorily compelled to investigate the accident under its authorizing statute, due to the fatalities among members of the public. Although we remain hopeful of meeting the timeline and key objectives discussed above, we also note that the investigation has encountered very significant obstacles and challenges.

At the same time the CSB deployed its investigative team and associated fire and blast experts, the Justice Department's Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) mobilized a large "national response team" that assumed essentially exclusive control of the incident site in concert with Texas State Fire Marshal's Office (SFMO) personnel. These criminal investigators have exercised exclusive control of the site for a full one-month period, from April 17, 2013, until today and have altered or removed almost all relevant physical evidence at the site. The ATF and SFMO consistently expressed the position that CSB was not permitted to conduct separate interviews, prepare expert analysis, or author its own independent report. The ATF and SFMO stated that because in their view this was exclusively a criminal investigation, there could be only one version of what occurred and one report.

During the critical period before the accident site was completely altered, CSB investigators were explicitly excluded from the site by ATF/SFMO and received only limited access days later. The CSB investigative leadership had no meaningful input into how the site was managed or what pieces of potential evidence were collected, altered, removed, destroyed, or discarded. Throughout this period, the incident site was massively and irreversibly altered under the direction of ATF personnel, who used cranes, bulldozers, and other excavation apparatus in an ultimately unsuccessful quest to find a single ignition source for the original fire. In a news statement on May 16, the ATF said that over the past month it has "spent approximately $500,000 in the rental of heavy equipment, which assisted in excavating the scene"[2] – fully half the cost of their overall inquiry.

In return for limited and unsatisfactory site access, the CSB had to agree to conduct no witness interviews, which form an integral and essential part of the CSB investigative process. This state of affairs with witness interviews continued for almost three weeks after the incident -- an unprecedented and harmful delay. On the morning of May 7, the CSB finally commenced its interview process with a knowledgeable plant employee who had already been interviewed multiple times by the ATF. As soon as the witness left his car near the CSB's temporary offices in downtown West, he was suddenly surrounded by four armed ATF and SFMO agents and taken away for further ATF interrogation at an unknown location. This occurred without any explanation or prior notice to the CSB. Only after numerous protests and inquiries did the witness eventually reappear about four hours later.

[2] http://www.atf.gov/press/releases/2013/05/051613-hou-atf-and-the-state-fire-marshals-office-conclude-scene-investigation-at-the-west-fertilizer-plant.html (Accessed May 17, 2013).

Other troubling occurrences include the removal by ATF of chemical evidence from the site (such as residual ammonium nitrate masses that might show signs of how the material became sensitized to explosion). These actions followed a May 4 written agreement between the ATF and the CSB that explicitly provided the CSB with authority to take its own chemical samples. ATF further disregarded the May 4 agreement by denying site access to CSB personnel after May 13, including denying access to two presidentially appointed CSB board members.

Finally in announcing its departure from the site in a news conference on May 16, ATF officials called the incident of "undetermined" origin and proposed three possible ignition sources for the initial small fire: an electric fault, a golf cart, or an "intentional act."[3] In response to media questions, the state's assistant fire marshal said the ATF/SFMO team would not release its collected evidence to the CSB because of what he termed the "ongoing criminal investigation." This collected evidence, which remains unavailable, includes chemical samples, unique company documents that potentially include chemical inventory information and safety records,[4] debris objects collected from the site, and digital measurements of the AN explosion crater that the ATF obtained and then denied the CSB and other parties the right to obtain separately. The ATF then dug up the crater with heavy equipment, making duplication of the measurements impossible.

Conclusion

The CSB is uniquely positioned to determine the root cause of major chemical accidents and to make safety recommendations that will assure greater safety at industrial facilities around the country. The April 17 explosion at West Fertilizer was a terrible tragedy and one of the worst chemical accidents to occur in the U.S. in decades. We believe the CSB's findings and safety recommendations will be important not only to the community of West, Texas, but also to similar facilities and communities across the country where ammonium nitrate or other hazardous substances are produced, stored, or distributed.

Due to the circumstances outlined above, whereby the CSB was precluded from obtaining key evidentiary materials currently in the possession of ATF/SFMO, we would

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[3] We are not aware of any affirmative evidence of an intentional criminal act that led or contributed to the fire or explosion. All indications are that the event was an industrial accident within the CSB's investigative jurisdiction. Although ATF personnel detained a West paramedic on illegal munitions charges on May 3, no evidence has surfaced linking him to the initiation of the incident. West municipal officials have stated they believe the incident was of accidental original and discounted any role of the paramedic.

[4] During periods when they did have limited access to the site, CSB investigators observed unsecured company documents blowing around the site and exposed to rain and the elements. The ATF had no apparent interest in the documents, which the CSB observed included potentially unique records of chemicals stored or sold at the site. The CSB team pointed out this issue to ATF field personnel, and then the CSB chairperson raised the issue to U.S. Deputy Attorney General James Cole in a meeting in Washington, DC, on April 26, at which meeting the deputy attorney general and the chairperson pledged cooperation, preservation of evidence at West, and the ability for the CSB to conduct its independent statutory investigation. ATF later asserted the documents at West had been secured but has nonetheless refused to provide any copies to the CSB, and their current location is unknown.

like to request your assistance in obtaining a number of specific items that remain under ATF/SFMO custody. They include but are not limited to:

- Continued access to the accident site
- GIS mapping of the crater and GPS debris coordinates
- Priority access to the physical evidence
- Unique company documents including:
    - Records of chemical inventories
    - Safety records
    - Employee training records
    - Any other company documents
- Debris collected from the site
- Digital measurements of the AN explosion crater

To date the CSB has experienced significant obstacles that potentially compromise and delay our ability to complete the "comprehensive investigation" that you have rightly demanded, and that we would very much like to produce. We expect that with your support we can obtain the critical investigation data necessary to generate a valuable safety investigation that will provide clear, actionable recommendations to prevent the repetition of this tragedy.

Again, thank you for your continued support of the CSB's mission and activities.

Sincerely,

Rafael Moure-Eraso, Ph.D., CIH
Chairperson