



U.S. Chemical Safety and
Hazard Investigation Board

NEWS RELEASE
U.S. CHEMICAL SAFETY BOARD
EMBARGOED UNTIL
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**CSB to Conduct Full Investigation of Causes of
Catastrophic Fertilizer Tank Collapse at Allied Terminals
in Chesapeake, Virginia; Issues Urgent Safety
Recommendations Citing Hazard to Public from Welding
Defects on Several Remaining Tanks**

Chesapeake, Virginia, December 8, 2008 – The U.S. Chemical Safety Board (CSB) today issued urgent safety recommendations following last month's collapse of a two-million-gallon liquid fertilizer storage tank at the Allied Terminals distribution facility in Chesapeake, VA, urging the company to take immediate steps to safeguard three other nearby fertilizer storage tanks from possible failure.

According to the text of the urgent recommendations which were unanimously approved by the Board and released at a news conference here today, "The potential for collapse of a tank poses an unacceptably high risk of causing substantial property damage or a number of injuries or possibly deaths among the general public."

The November 12 tank collapse seriously injured two contract workers, who were hospitalized. Two members of the public who tried to aid the injured men required treatment likely related to exposure to ammonia vapor from the released fertilizer. The fertilizer overtopped a containment dike and flooded sections of a nearby residential neighborhood, requiring ongoing remediation of the soil. At least 200,000 gallons of spilled fertilizer could not be accounted for, and some reached the nearby Elizabeth River, which flows into the Chesapeake Bay.

"The urgent recommendations we released today are designed to protect the safety of workers, the public and the environment," said CSB Chairman John S. Bresland. "We are calling on Allied Terminals to immediately reduce the hazard from the remaining tanks by lowering the maximum safe fill height and to retain a qualified tank engineering firm to assess the tanks' safety. The independent engineering analysis should be conducted promptly, within 30 days, and its results provided to the city." The recommendations further call on Allied Terminals to develop and implement a corrective action plan for any identified deficiencies in the tanks.

CSB investigators concluded that the November 12 collapse of Tank 201, which contained an aqueous solution of urea and ammonium nitrate fertilizer, likely resulted from defective welds on the tank wall. The welding was performed in 2006 as part of a project to strengthen four fertilizer tanks that were constructed around 1929 by replacing vertical riveted seams.



“We found a number of welding defects where the modifications were made, including incomplete penetration of the welding metal into the joints,” said CSB Lead Investigator Robert J. Hall, P.E. “These welding defects likely weakened Tank 201 and led to its failure when the liquid was raised to a level slightly below the tank's recommended safe fill height.”

In the course of investigating the collapse of Tank 201 last week, CSB investigators determined that three other large fertilizer tanks, which were welded during the same time period, likely have welding defects similar to Tank 201—including insufficient reinforcement, porosity, and weld undercut—that could cause the tanks to fail. The closest of the three large tanks is located 250 feet from homes.

Investigators said that the level of risk could not be quantified based on their external visual examination of the welds and that a thorough, independent engineering analysis should be conducted, including testing to check for the internal defects in the welds.

Following the welding of the four fertilizer tanks, and before the collapse of Tank 201, Allied Terminals had hired HMT Inspection, a Texas-based tank engineering firm with offices worldwide, to examine each tank in accordance with existing industry safety guidelines for petroleum tanks. HMT's report did not identify the welding defects that led to this failure; it recommended a “safe fill height” for each tank. However, the

November 12 collapse of Tank 201 occurred while the tank was being filled to a level about three inches below the 27-foot safe fill height recommended by HMT.

Chairman Bresland said the remainder of the CSB investigation would focus on understanding why the welding defects occurred, why the tank deficiencies were not detected and corrected, and whether improvements are needed in the oversight of aboveground storage tank safety.

“At this stage in the investigation, we are concerned there is an apparent lack of clear regulations covering the safety of non-petroleum aboveground storage tanks,” Mr. Bresland said. “Because of the hazard such tanks can pose, the CSB will examine whether additional safeguards are necessary at the national and state levels.”

The CSB has identified similar oversight issues in other aboveground storage tank accidents. For example, the CSB previously investigated a sulfuric acid tank collapse in 2001 at the then-Motiva oil refinery in Delaware City, Delaware. Following that accident, which killed a contractor, injured eight others, and polluted the Delaware River, the Delaware state legislature enacted an extensive regulatory system for aboveground storage tanks, under the Jeffrey Davis Aboveground Storage Tank Act.

Mr. Bresland noted the outstanding coordination among the various local, state, and federal agencies responding to the spill, including the Chesapeake Fire Department, the Virginia Department of Labor and Industry, and the Region III office of the U.S. Environmental Protection Agency. Allied Terminals has been cooperating with the CSB investigation.

The CSB is an independent federal agency charged with investigating industrial chemical accidents. The agency's board members are appointed by the president and confirmed by the Senate. CSB investigations look into all aspects of chemical accidents, including physical causes such as equipment failure as well as inadequacies in regulations, industry standards, and safety management systems.

The Board does not issue citations or fines but does make safety recommendations to plants, industry organizations, labor groups, and regulatory agencies such as OSHA and EPA. Visit our website, www.csb.gov.

For more information, contact Sandy Gilmour at (202) 251-5496 cell or Hillary Cohen at (202) 446-8094 cell.

**U.S. CHEMICAL SAFETY AND HAZARD
INVESTIGATION BOARD**

Urgent Recommendations

Whereas:

1. Allied Terminals Incorporated, 502 Hill Street, Chesapeake, Virginia, stores liquid fertilizer¹ in aboveground storage tanks (designated Tanks 201, 202, 205, and 209). The tanks were constructed circa 1929 for the storage of petroleum products. Rivets were used to join the horizontal and vertical shell plate.
2. Allied Terminals contracted G & T Fabricators, Inc., a welding company, to replace the vertical riveted joints on each tank with welded joints in 2006. The contract required the work to comply with American Petroleum Institute (API) Standard 653 - *Tank Inspection, Repair Alteration, and Reconstruction*.
3. Allied Terminals contracted HMT Inspection, a tank inspection company, to perform an API Standard 653 out-of-service inspection on each of the four tanks after they were modified by the addition of the welded joints. As part of the inspection, the tank inspection company specified a “safe fill height” for liquid fertilizer to be stored in each tank.
4. On November 12, 2008, Tank 201 catastrophically failed while it was being filled to the “safe fill height” established by HMT Inspection, Inc. At the time of the failure the liquid level was at about 26.74 feet, which was less than the specified “safe fill height” of 27.01 feet. More than two million gallons of liquid fertilizer were released nearly instantaneously .
5. The released liquid fertilizer overtopped the secondary containment dike, flooding the facility and portions of an adjacent residential neighborhood of about 40 homes. Liquid fertilizer also spilled into the nearby Elizabeth River. Based on the quantity of liquid fertilizer recovered, it is estimated that at least 200,000 gallons are unaccounted for now.
6. The collapsing tank wall seriously injured two contractors working at the facility; two employees of an adjacent business who came to the aid of the injured contractors were injured by exposure to the released materials.
7. Post-incident visual examination of Tank 201 identified defective welds as the likely immediate cause of the catastrophic failure.
8. Post-incident visual examination of Tanks 202, 205, and 209² revealed numerous welding defects that were similar to defects observed on the remnants of the collapsed tank, including insufficient reinforcement, porosity, and weld undercut.

¹ An aqueous mixture of ammonium nitrate and urea.

² These tanks still contain liquid fertilizer.

9. Since Tank 201 failed at a fill level below its “safe fill height” established by HMT Inspection, Inc. the “safe fill height” established by HMT Inspection, Inc. for Tanks 202, 205, and 209 may not prevent failure of these tanks.
10. Occupied residences are located as close as 250 feet from the tanks . The secondary containment around the tanks is likely not adequate to prevent liquid from a catastrophic tank collapse from reaching residential structures. Accordingly, the potential for collapse of a tank poses an unacceptably high risk of causing substantial property damage or a number of injuries or possibly deaths among the general public.
11. Under 42 U.S.C. §7412(r)(6)(C) (ii), the Board is charged with “recommending measures to reduce the likelihood or the consequences of accidental releases and proposing corrective steps to make chemical production, processing, handling and storage as safe and free from risk of injury as is possible”
12. The Board may authorize the issuance of an urgent safety recommendation before a final investigation report is completed where there is a safety issue considered an imminent hazard that has the potential to cause serious harm unless it is rectified in a short timeframe.

Accordingly:

Pursuant to its authority under 42 U.S.C. §7412(r)(6)(C)(i) and (ii), and in the interest of promoting safer operations at Allied Terminal, Inc. and protecting the adjacent community, the Board makes the following urgent safety recommendations:

To Allied Terminals, Inc.

2009-03-I-VA-UR1

Take immediate action to reduce the risk of a catastrophic failure of Tanks 202, 205, and 209 at the Allied Terminals Hill Street facility including but not limited to significantly reducing the maximum liquid levels (“safe fill height”) based on sound engineering principles. Report the actions taken to the City of Chesapeake.

2009-03-I-VA-UR2

Select and retain a qualified, independent tank engineering firm to evaluate Tanks 202, 205, and 209 and determine their fitness for continued service. The evaluation should be based on recognized and generally accepted good engineering practices, such as API 653 - *Tank Inspection, Repair Alteration, and Reconstruction* and API 579 - *Fitness for Service*.

2009-03-I-VA-UR3

Within 30 days, provide the report prepared by the independent tank engineering firm to the City of Chesapeake, together with a comprehensive action plan and schedule to address any identified deficiencies.