

U.S. CHEMICAL SAFETY BOARD
STATEMENTS
JOHN BRESLAND, CSB CHAIRMAN
JOHN VORDERBRUEGGEN, CSB LEAD INVESTIGATOR

NEWS CONFERENCE APRIL 23, 2009
INSTITUTE, WEST VIRGINIA

STATEMENT BY CHAIRMAN BRESLAND:

Good morning and welcome to this Chemical Safety Board or CSB news conference. We thank you for coming.

On August 28, 2008, a powerful explosion occurred within the Methomyl -- Larvin unit at the Bayer CropScience plant in Institute, West Virginia. In our presentation this morning we shall refer to the plant as Bayer, the name by which it is commonly known here in the Kanawha Valley. Two operators, Barry Withrow and Bill Oxley, were fatally injured. Mr. Withrow died at the scene, and Mr. Oxley died 41 days later at a burn center in Pittsburgh.

Eight workers reported symptoms of chemical exposure, including aches and respiratory and intestinal distress, involving two employees of the Norfolk Southern railroad company and five Tyler Mountain, West Virginia volunteer firefighters, and an Institute, West Virginia volunteer firefighter. Two sought treatment at a hospital emergency room the next day, were treated, and released.

Our concern and condolences remain with the families, friends, and co-workers of the workers who died in this tragedy. We would also like to acknowledge that first responders acted admirably in a very difficult situation. I was at the accident site along with members of our investigation team two days after the accident as our investigation began. We are in Institute today to give the community, the company, and others in the chemical industry the benefit of what we have learned so far about this accident. That's the mission of the CSB.

This accident was caused by a runaway reaction in a 4000 gallon capacity vessel called the "residue treater" in the plant's Methomyl unit. Methomyl is a key raw material for the

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production of Bayer's brand name insecticide, Larvin. The runaway reaction created extremely high temperatures and pressure, and ruptured the vessel, sending it careening into the unit a distance of about 50 feet.

The explosion at Bayer was a very serious and tragic event that could have had additional grave consequences. The CSB has found significant lapses in the plant's process safety management.

The accident occurred during the startup of the Methomyl/Larvin unit after a prolonged shutdown period. The plant had just installed new and completely different computer control equipment to run the Methomyl unit. Management assumed the operating experience on the control system for Larvin production equipment, that had been upgraded months earlier, provided adequate hands-on experience that would translate to the Methomyl equipment. But based on unit personnel interviews, the CSB concluded the training program for this new control system was inadequate.

As in earlier unit startups, operators had to override critical safety systems in order to work around problems with an undersized heater. And, operators had routinely worked 12 and sometimes 18 hour days in the three months leading to the accident – so worker fatigue may have been a factor – something we are looking into.

The explosion occurred within 80 feet of a pressure vessel containing methyl isocyanate, or MIC, a raw material used to make Methomyl, and the same chemical that caused death and injury in the Bhopal accident 25 years ago.

As our investigation continues, we will look further into the issues surrounding the location of the MIC tank and its potential vulnerability. We note that other chemical companies no longer store large quantities of MIC at their facilities. We are looking into technology used by some companies, notably DuPont in LaPorte, Texas, that produce and use MIC as needed immediately for production, eliminating the need for storage.

CSB investigators have examined the emergency response to the accident and interviewed many of the participants. At our public meeting tonight, we will present a detailed, minute-by-minute chronology of the emergency response.

I am very troubled by our observations of the inadequacy of Bayer's emergency response and emergency communications. For example, the county's 9-1-1 call center was told, fifteen minutes into the response, that no dangerous chemicals had been released. That information came from Bayer's incident commander and was relayed by the Institute volunteer fire chief, who was also a Bayer employee.

That statement is clearly inaccurate, since Methomyl is toxic, and its uncontrolled decomposition may release highly toxic byproducts.

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It was more than 30 minutes later that Bayer recommended to the 9-1-1 center to issue a shelter-in-place advisory for the surrounding communities, but not before local authorities had already made the decision to do so.

It was more than two hours before Bayer reported the accident to the National Response Center, and that notification erroneously omitted the fatality and the critical injury.

At this time, I would like to introduce John Vorderbrueggen, our lead investigator in the Bayer case. Mr. Vorderbrueggen is a registered professional engineer and experienced investigator, and heads a four-person team looking into all relevant aspects of this accident.

Mr. Vorderbrueggen:

STATEMENT BY JOHN VORDERBRUEGGEN

Thank you Chairman Bresland.

Bayer CropScience in Institute is a large chemical complex of more than 400 acres that was first constructed in the 1940's. Until 1986, it was owned by Union Carbide, which produced carbamate pesticides at the site. It was acquired by Bayer in 2002, and now has more than 500 employees.

The accident occurred after an extended maintenance shutdown of the entire Methomyl section of the Larvin pesticide-manufacturing unit. Methomyl is a raw material used to make Larvin.

During an extended unit outage over the summer, Bayer upgraded the computer control system for the unit, replacing a Honeywell system with one purchased from Siemens. The control screens were completely different, yet from unit personnel interviews our team concluded that the operator training program was inadequate, considering the complexities of the Methomyl unit. For example, operators told the CSB that the old computer system keyboard entry method was well entrenched into their activities but they were not yet comfortable with the new mouse-controlled command entry method. Also, computer display screens were still being designed even as the Methomyl startup was proceeding. Furthermore, the written operating procedures for the unit were significantly out of date and did not adequately address all process equipment startup and normal operating steps.

As the chairman mentioned, the residue treater, a large pressure vessel, had an undersized heater. Operators told the CSB that it was incapable of heating the contents of the residue treater to the temperature required to begin the controlled decomposition of Methomyl.

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As a result of the longstanding heater problem, operators had to use a workaround. This involved defeating –or deactivating—at least two safety interlocks controlling flow into the residue treater vessel.

The CSB found a normalized deviation from the operating procedure of starting to feed the Methomyl containing liquid into the under-heated vessel. Heat from the Methomyl decomposition reaction would be used to bring the residue treater contents up the few degrees needed to achieve the minimum operating temperature. But bypassing the interlocks on the Methomyl-solvent feed valve made it more likely that too much undecomposed Methomyl could accumulate in the vessel. Safety analyses and the operating procedure warned that Methomyl concentration above about one percent inside the Residue Treater would likely cause it to violently rupture.

As a result of equipment deficiencies, improper procedures, and lack of training on the new computer control equipment the vessel was charged with as much as a 20 percent concentration of Methomyl on the night of the explosion. The rapidly decomposing Methomyl caused the residue treater pressure to begin climbing.

The control room operator saw the unexpected, rapidly increasing pressure displayed on the control console, so he asked outside operators to check for a blockage on the residue treater vent line.

As the operators approached the equipment, the vessel relief valves opened to start relieving excess pressure. But the valves were overwhelmed by the rapidly increasing and runaway reaction and could not release the pressure fast enough. Without warning, the residue treater suddenly ruptured, ejecting as much as 2500 gallons of highly flammable and toxic liquid. The 5500 pound vessel careened into the unit, destroying steel columns, pipes, and other equipment in its path.

The equipment deficiencies – particularly the undersized vessel heater, had been known to the company for years, yet neither a safety analysis nor a replacement of the heater were ever made. Operators were required to do the workarounds – overriding safety devices –to get the Methomyl in the residue treater up to the correct temperature. The workarounds –which violated Bayer’s operating procedure – became the norm.

Then came the maintenance shutdown and installation of the new computer control system with new on-screen displays, and different operator interface. Not only were the safety interlocks bypassed, as had become the norm, but on this startup the residue treater had not been pre-filled with solvent, a critical step in the startup sequence intended to keep the Methomyl concentration below one percent.

And, as the chairman mentioned, worker fatigue from extended work hours in the months leading up to the restart is well known to cause people to lose focus and attention.

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We believe all these factors came together to create a situation in which Methomyl accumulated to dangerous concentrations inside the residue treater, then suddenly and uncontrollably began decomposing. It was a runaway chemical reaction.

I will now turn the podium back to Chairman Bresland.

Chairman BRESLAND COMMENTS:

Thank you Mr. Vorderbrueggen.

These equipment deficiencies and procedural deviations that we have talked about this morning did not receive adequate, and in some cases, any management-of-change reviews to ensure the changes would be safely implemented. Such management-of-change reviews have been long recognized to be critical elements in effective management systems, and are specifically required by the OSHA Process Safety Management (PSM) standard. These reviews are intended to identify exactly the kinds of deficiencies that existed at the Methomyl/Larvin unit at Bayer, before the restart began.

It was fortunate that debris from the explosion did not cause a release of highly-toxic MIC. The MIC storage vessel with more than 13,000 pounds was located approximately 80 feet from the explosion epicenter, and MIC-containing piping was in overhead pipe racks in the area.

The tank was protected by steel wire-rope blankets designed to protect the MIC storage vessel from debris impacts. The CSB plans to review the history of the engineering studies used to establish the safe location of the MIC vessel and consider if further safety measures, or relocating the vessel, might be warranted.

Now, let me invite citizens of the community to join us at our CSB public meeting this evening. The meeting will begin at 6:30 p.m. at the West Virginia State University Wilson Building, Multipurpose Room, 103 University Union, in Institute. The meeting is free and open to the public. It will feature an extensive presentation by our entire investigation team, and a panel including a Bayer spokesperson, the West Virginia State Fire Marshal, and others. The complete list is in the news release – which is now posted online at www.CSB.gov.

Finally, let me say a word about the secrecy claims that have been made by Bayer concerning the information collected during our investigation. As many of you know, Bayer has sought to designate several thousand pages of investigative documents as sensitive security information, or SSI, under the Maritime Transportation Security Act.

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While the status of these documents has not yet been resolved, I want to assure the public that the presentation tonight will include the fullest possible discussion of all the issues, including MIC. We remain firmly committed to the public's right to know.

At Tuesday's Congressional hearing, the president of Bayer CropScience stated that Bayer's reasons for raising the SSI issue to the CSB in February included – quote ---

“a desire to limit negative publicity generally about the company or the Institute facility, to avoid public pressure to reduce the volume of MIC that is produced and stored at Institute by changing to alternative technologies, or even calls by some in our community to eliminate MIC production entirely. “ end quote.

I am deeply disappointed with Bayer's conduct in this matter, and I can assure the public the CSB will continue to conduct a thorough investigation of all the issues and recommend whatever changes will best protect the workforce and the public.

That concludes our statements this morning. I stress that our investigation is continuing and we expect to complete our final report, with safety recommendations, by the end of the year.

We will now take questions from the media, including from reporters who have joined us on the conference call. Please state your name and affiliation.

QUESTION AND ANSWER PERIOD

TAKE QUESTIONS FROM TELEPHONE CONFERENCE

MR BRESLAND:

Thank you for attending this news conference. We again remind everyone of our public meeting tonight at the university, 6:30 p.m.

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Thank you.

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